OptiPlex 7050 Small Form Factor

Owner's Manual

Regulatory Model: D11S
Regulatory Type: D11S002
July 2023
Rev. A04

Contents

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

1

Working on your computer

Topics:

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in reverse order.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTE: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

CAUTION: Exercise caution when handling Lithium-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.

NOTE: The color of your computer and certain components may appear differently than shown in this document.

Before working inside your computer

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

1. Save and close all open files and exit all open applications.
2. Shut down your computer. For Windows operating system, click **Start** > **Power** > **Shut down**.

NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.

3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.

CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

5. Remove any media card and optical disc from your computer, if applicable.

Turning off your computer

Turning off your — Windows

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer .

1. Click or tap  .
2. Click or tap and then click or tap **Shut down**.

NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

Turning off your computer — Windows 7

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1. Click **Start**.
2. Click **Shut Down**.

NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

After working inside your computer

NOTE: Leaving stray or loose screws inside your computer may severely damage your computer.

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

2

Disassembly and reassembly

Topics:

Recommended tools

The procedures in this document require the following tools:

- Small flat blade screwdriver
- Phillips # 1 screwdriver
- Small plastic scribe

Back cover

Removing cover

1. Follow the procedure in Before working inside your computer.
2. To release the cover:
   a. Slide the blue retention tab to the right to unlock the cover [1].
   b. Slide the cover toward the back of the computer [2].

3. Lift the cover to remove from the computer [3].

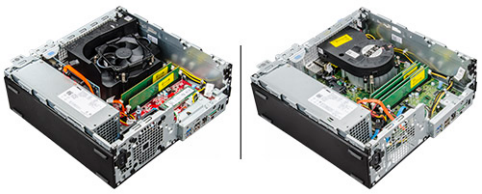
Installing the cover

1. Place the cover on the computer and slide the cover until it clicks into place.
2. Follow the procedure in After working inside your computer

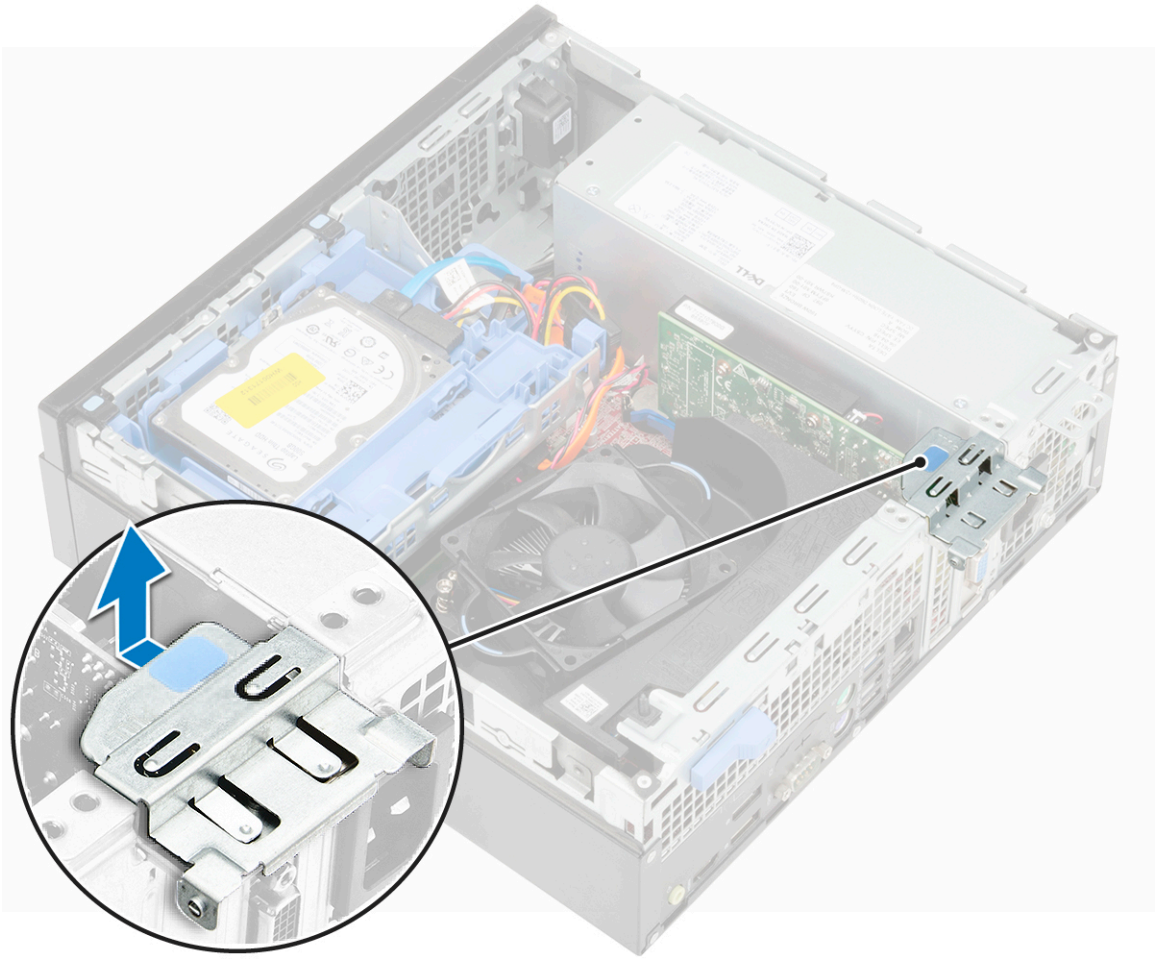
Expansion card

Removing expansion card

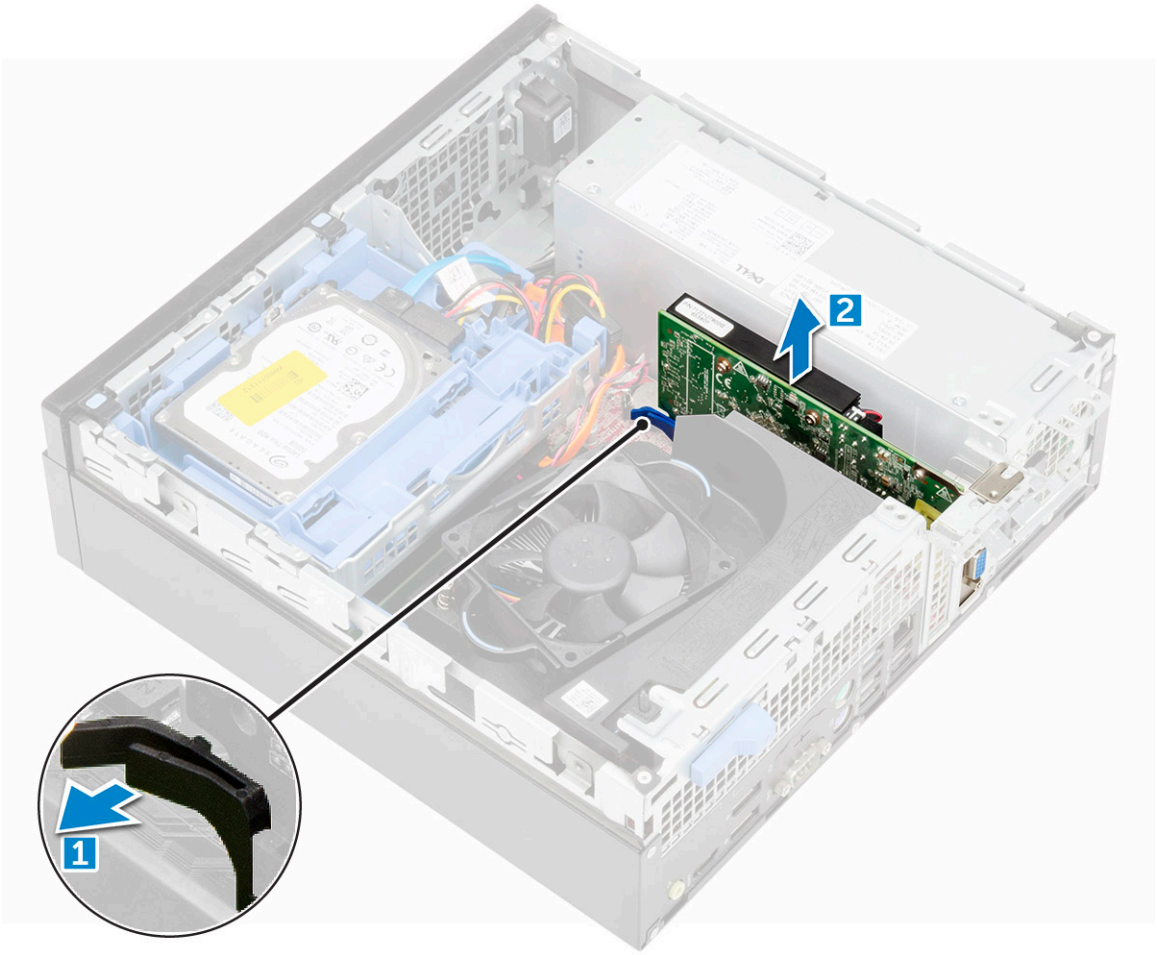
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the cover.
3. Pull the metal tab to open the expansion card latch.



4. To remove the expansion card:
   a. Pull the release tab at the base of the expansion card [1].
   b. Disconnect and lift the expansion card away from the connector [2].



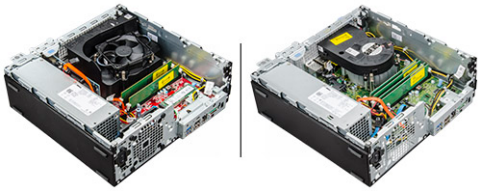
Installing the expansion card

1. Insert the expansion card into the connector on the system board.
2. Press the expansion card until it clicks into place.
3. Close the expansion card latch and press it until it clicks into place.
4. Install the cover.
5. Follow the procedure in After working inside your computer.

Coin cell battery

Removing coin cell battery

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:

a. cover

3. To remove the coin cell battery:
   a. Press the release latch until the coin cell battery pops out [1].
   b. Remove the coin cell battery from the connector on the system board [2].

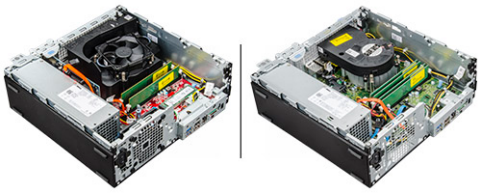
Installing the coin cell battery

1. Hold the coin cell battery with the "+" sign facing up and slide it under the securing tabs at the positive side of the connector.
2. Press the battery into the connector until it locks into place.
3. Install the:
   a. cover
4. Follow the procedure in After working inside your computer.

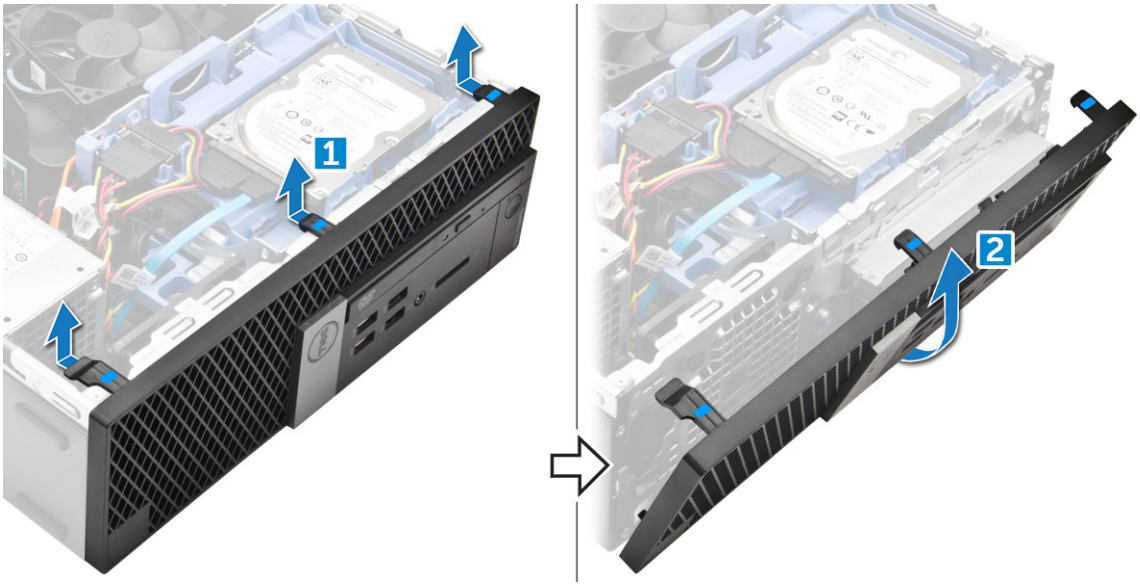
Bezel

Removing bezel

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the cover.
3. To remove the front bezel:
   a. Lift the tabs to release the front bezel from the computer [1].
   b. Remove the front bezel from the computer [2].



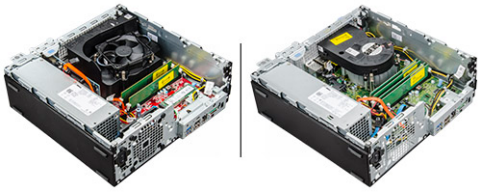
Installing the bezel

1. Insert the tabs on the bezel into the slots on the computer.
2. Press the bezel until the tabs clicks into place.
3. Install the cover.
4. Follow the procedure in After working inside your computer

Speaker

Removing speaker

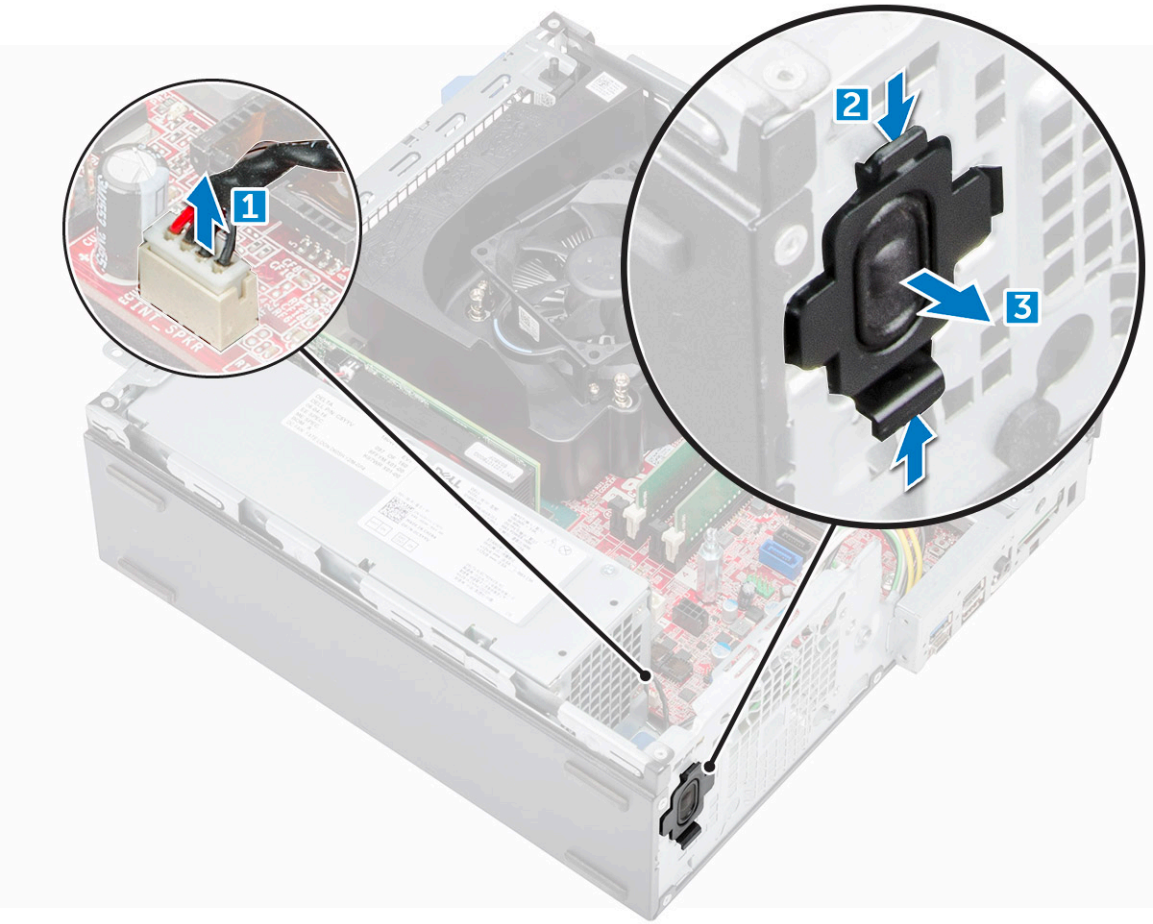
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover

b. bezel
c. 2.5–inch drive assembly
d. optical drive

3. To remove the speaker:
   a. Disconnect the speaker cable from the system board [1].
   b. Press the release tabs and pull the speaker out from the computer [2] [3].



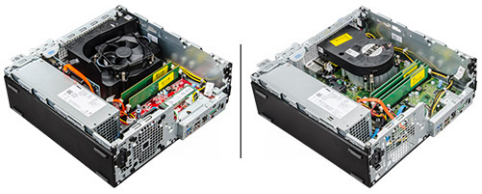
Installing the speaker

1. Insert the speaker into the slot and press it until it clicks into place.
2. Connect the speaker cable to the connector on the system board.
3. Install the:
   a. optical drive
   b. 2.5–inch drive assembly
   c. bezel
   d. cover
4. Follow the procedure in After working inside your computer.

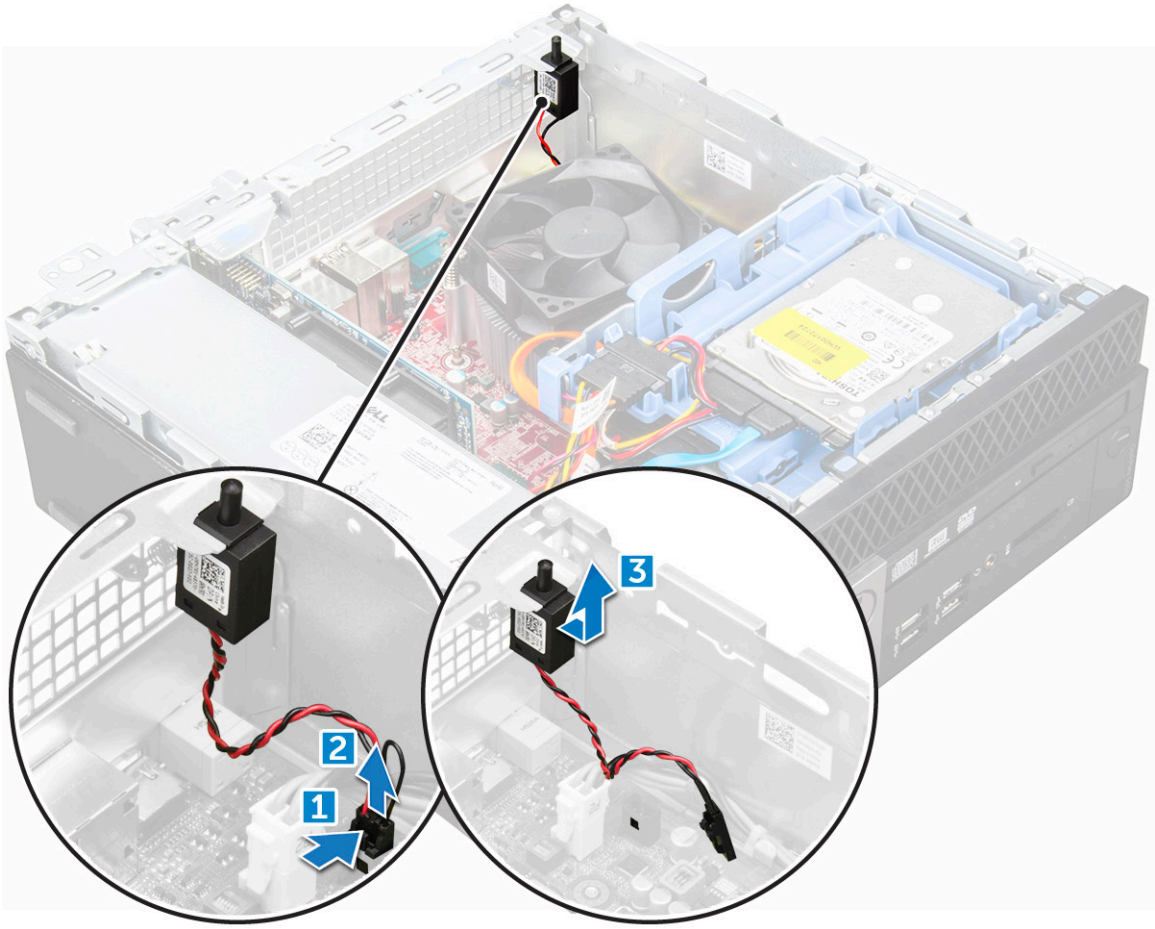
Intrusion switch

Removing intrusion switch

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
3. To remove the intrusion switch:
   a. Disconnect the intrusion switch cable from the connector on the system board [1][2].
   b. Slide the intrusion switch and lift it away from the computer [3].



Installing the intrusion switch

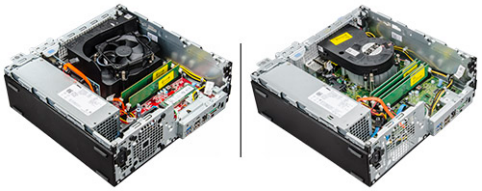
1. Insert the intrusion switch into the slot on the chassis.
2. Connect the intrusion switch cable to the system board.
3. Install the:
   a. cover
4. Follow the procedure in After working inside your computer.

Storage

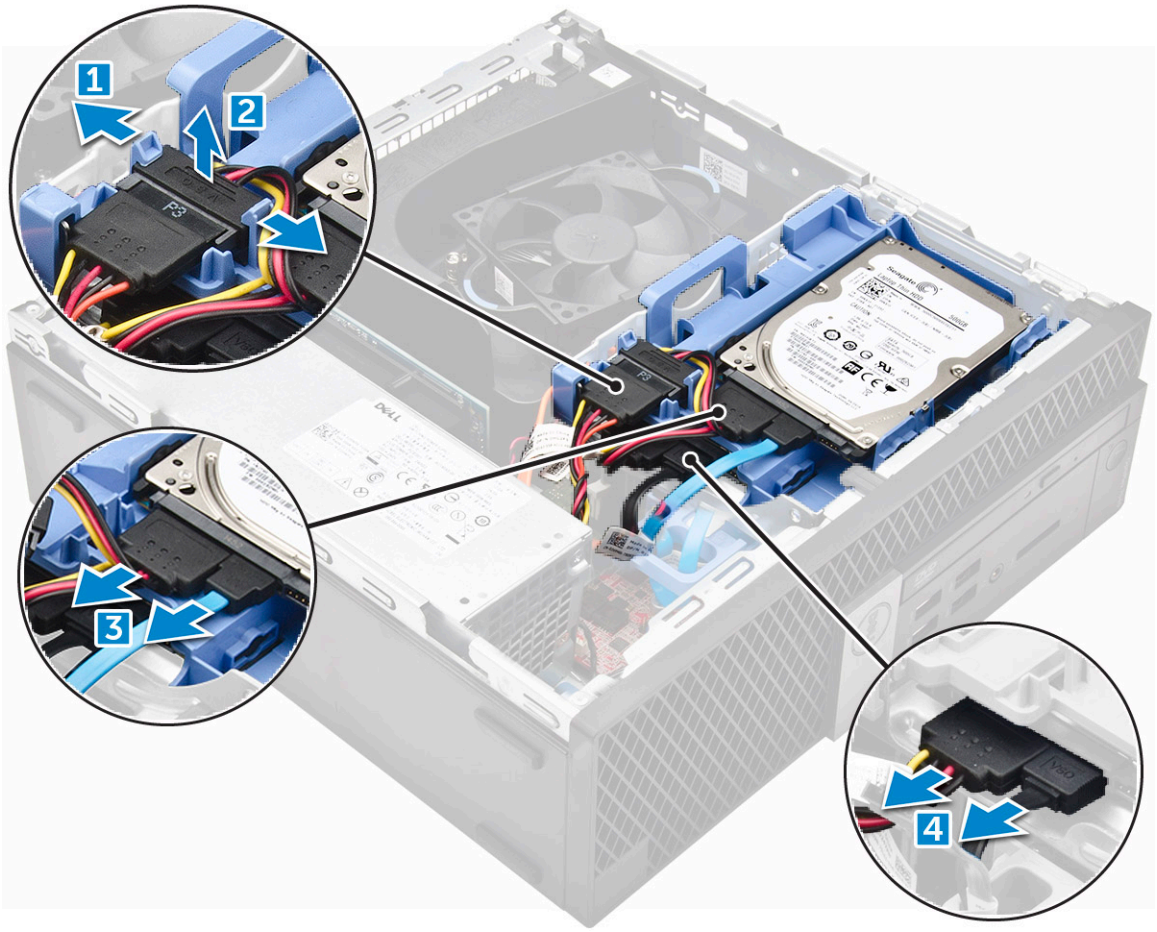
Depending on the configuration you choose, you will find either one 3.5–inch hard drive assembly or two 2.5–inch hard drive assemblies.

Removing 2.5-inch drive assembly

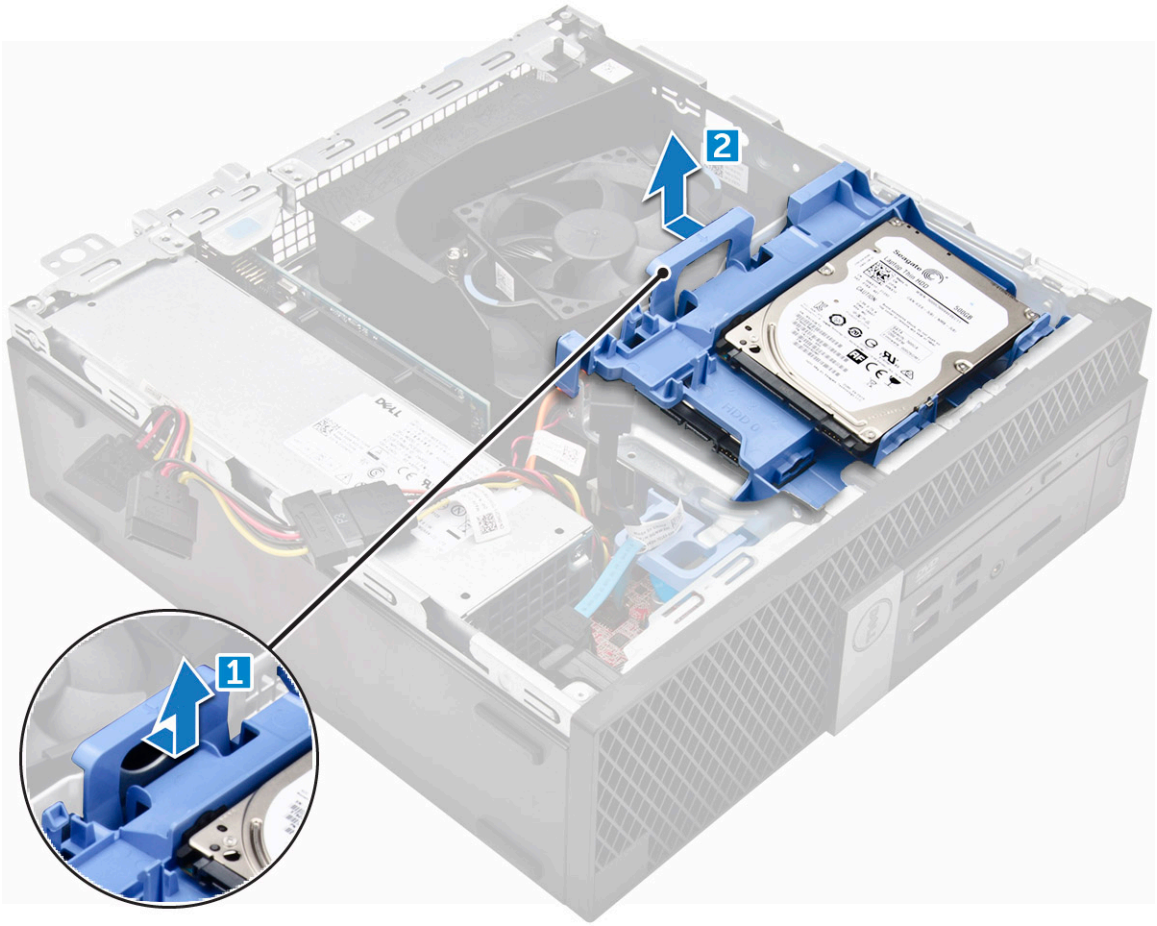
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
3. To remove the hard drive assembly:
   a. Push the release tabs and disconnect the hard drive power cable [1][2].
   b. Disconnect the hard drive assembly cables from the hard drive [3] [4].

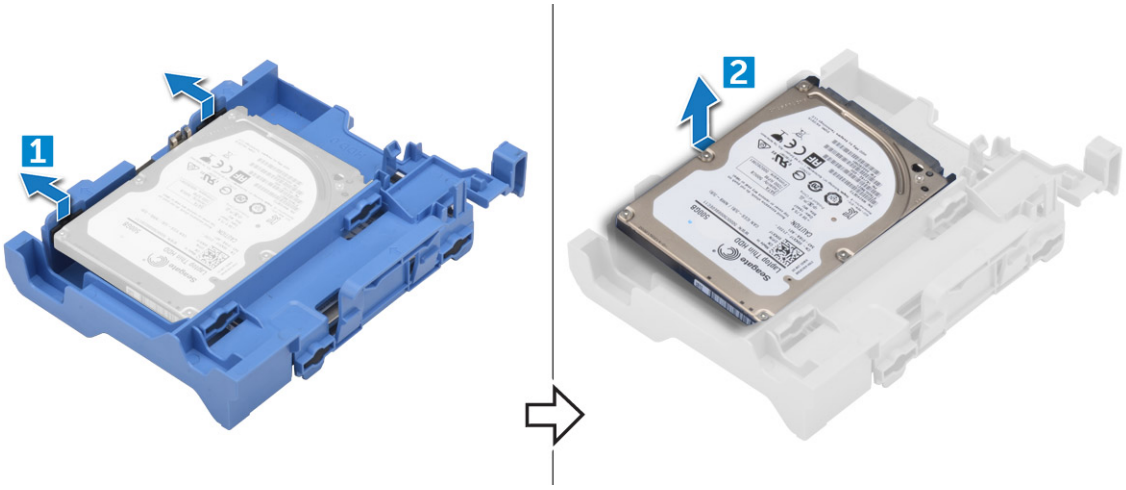


4. To remove the hard drive assembly:
   a. Hold and push the release tab [1].
   b. Lift the hard drive assembly from the computer [2].



Removing the 2.5-inch drive from the bracket

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. cover
   b. 2.5-inch drive assembly
3. To remove the drive:
   a. Pull one side of the drive bracket to disengage the pins on the bracket from the slots on the drive [1].
   b. Lift the drive out of the 2.5-inch drive bracket [2].



Installing the 2.5-inch drive into the bracket

NOTE: To install a secondary hard drive, the grommets will be shipped separately.

1. Align and insert the pins (secured by grommets) on the drive bracket with the slots on the sides of the drive.
2. Install the:
   a. 2.5-inch drive assembly
   b. cover
3. Follow the procedure in After Working Inside Your Computer.

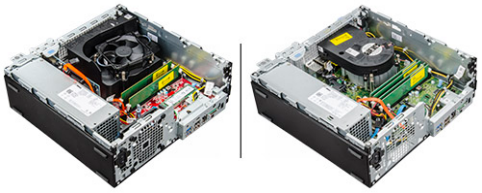
Installing the 2.5-inch drive assembly

1. Insert the drive assembly into the slot on the computer.
2. Connect the power cable to the slot on the drive bracket.
3. Install the:
   a. cover
4. Follow the procedure in After working inside your computer.

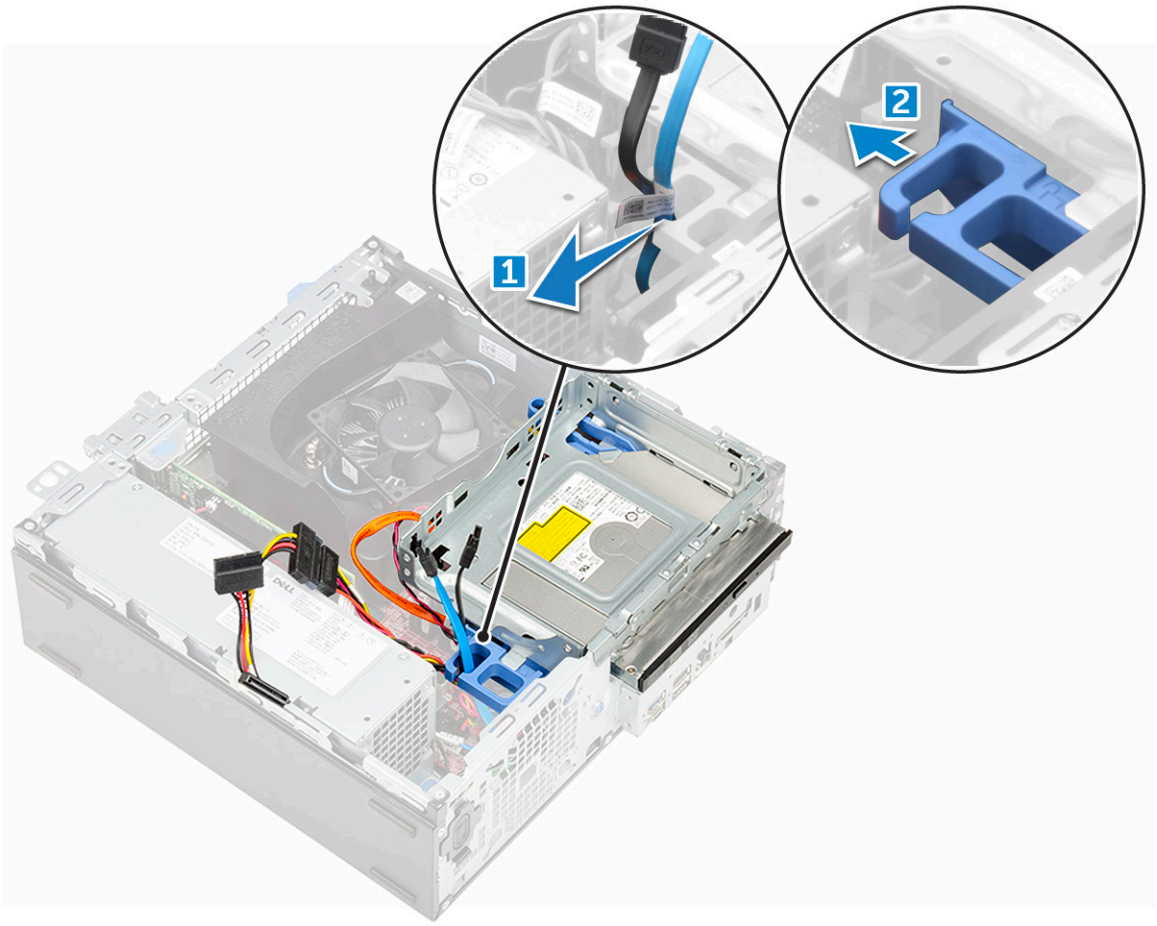
Optical drive

Removing the optical drive

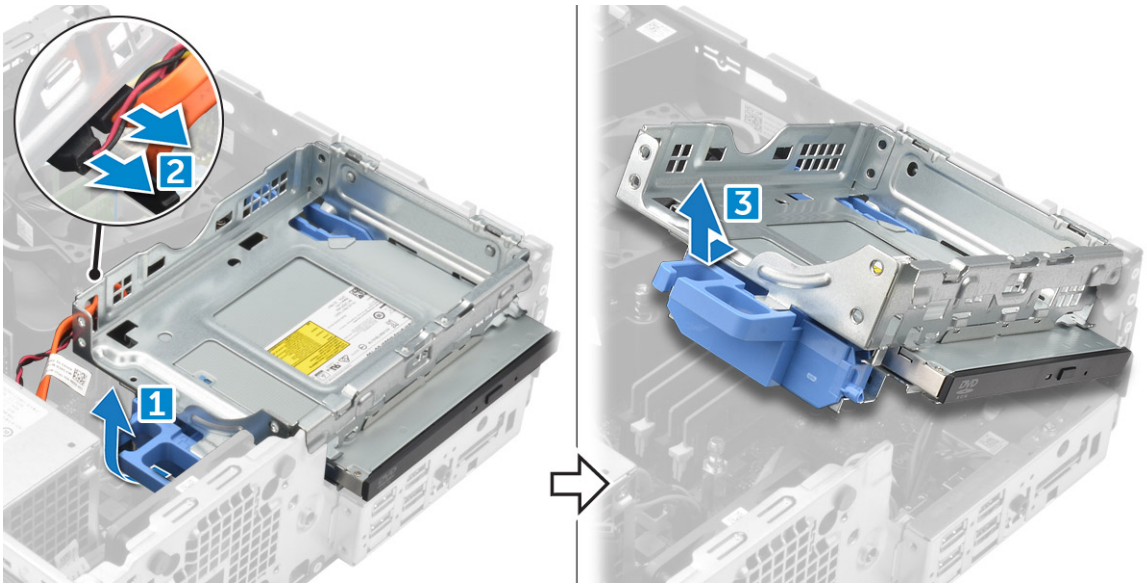
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



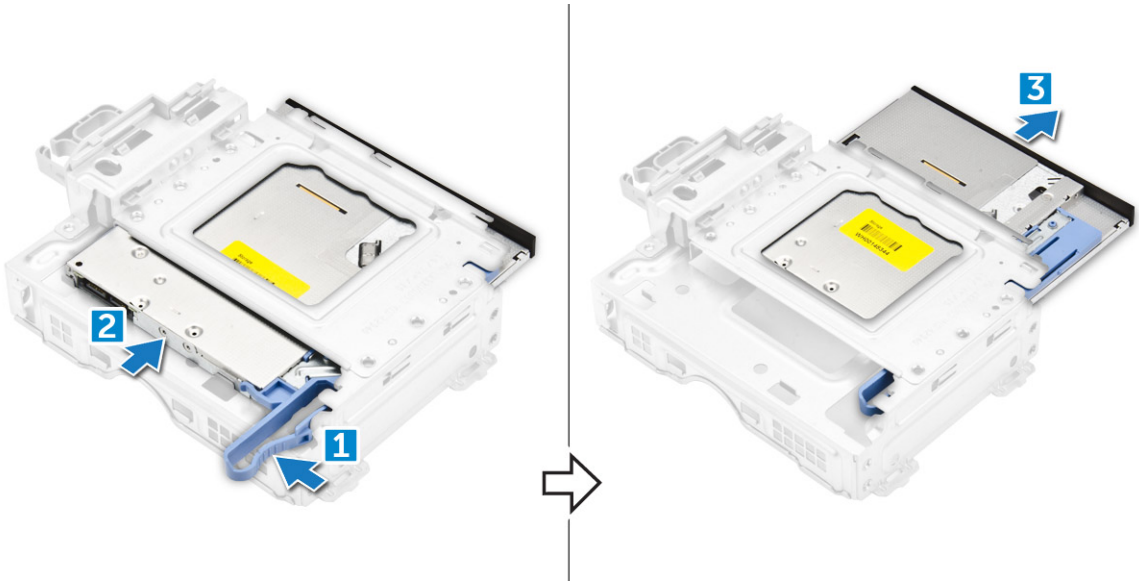
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
3. To release the optical drive module:
   a. Unthread the cables through the retention clip [1].
   b. Pull the blue tab to unlock the optical drive module [2].



4. To remove the optical drive module:
   a. Lift the tab upward to release the module [1].
   b. Holding the tab, disconnect the optical drive cables [2].
   c. Slide and lift the optical drive module away from the computer [3].



5. To remove the optical drive:
   a. Slide the tab to release the optical drive [1].
   b. Push the optical drive away from the module [2][3].



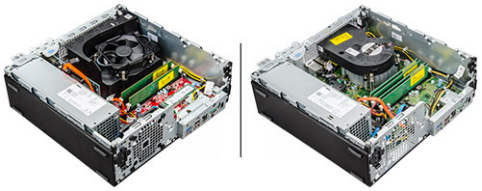
Installing the optical drive

1. Slide the optical drive into the optical drive module.
2. Install the:
   a. 2.5–inch drive assembly
   b. bezel
   c. cover
3. Follow the procedure in After working inside your computer.

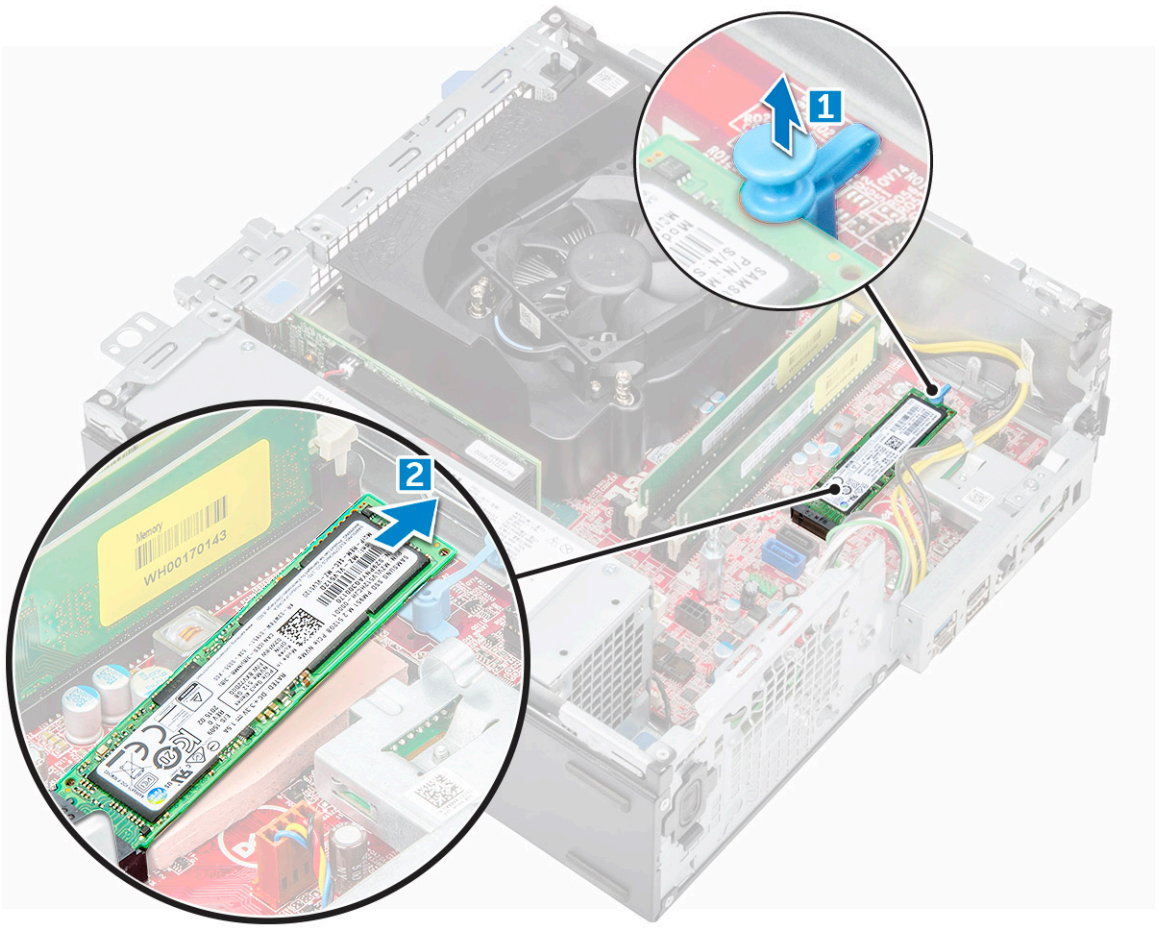
M.2 PCIe SSD

Removing the M.2 PCIe SSD

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
   d. optical drive
3. To remove the M.2 PCIe SSD:
   a. Pull the blue tab to release the M.2 PCIe SSD .
   b. Disconnect the M.2 PCIe SSD from the SSD connector.



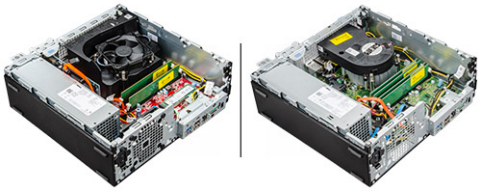
Installing the M.2 PCIe SSD

1. Insert the M.2 PCIe SSD to the connector.
2. Press the blue tab to secure the M.2 PCIe SSD.
3. Install the:
   a. Optical drive
   b. 2.5–inch drive assembly
   c. bezel
   d. cover
4. Follow the procedure in After working inside your computer.

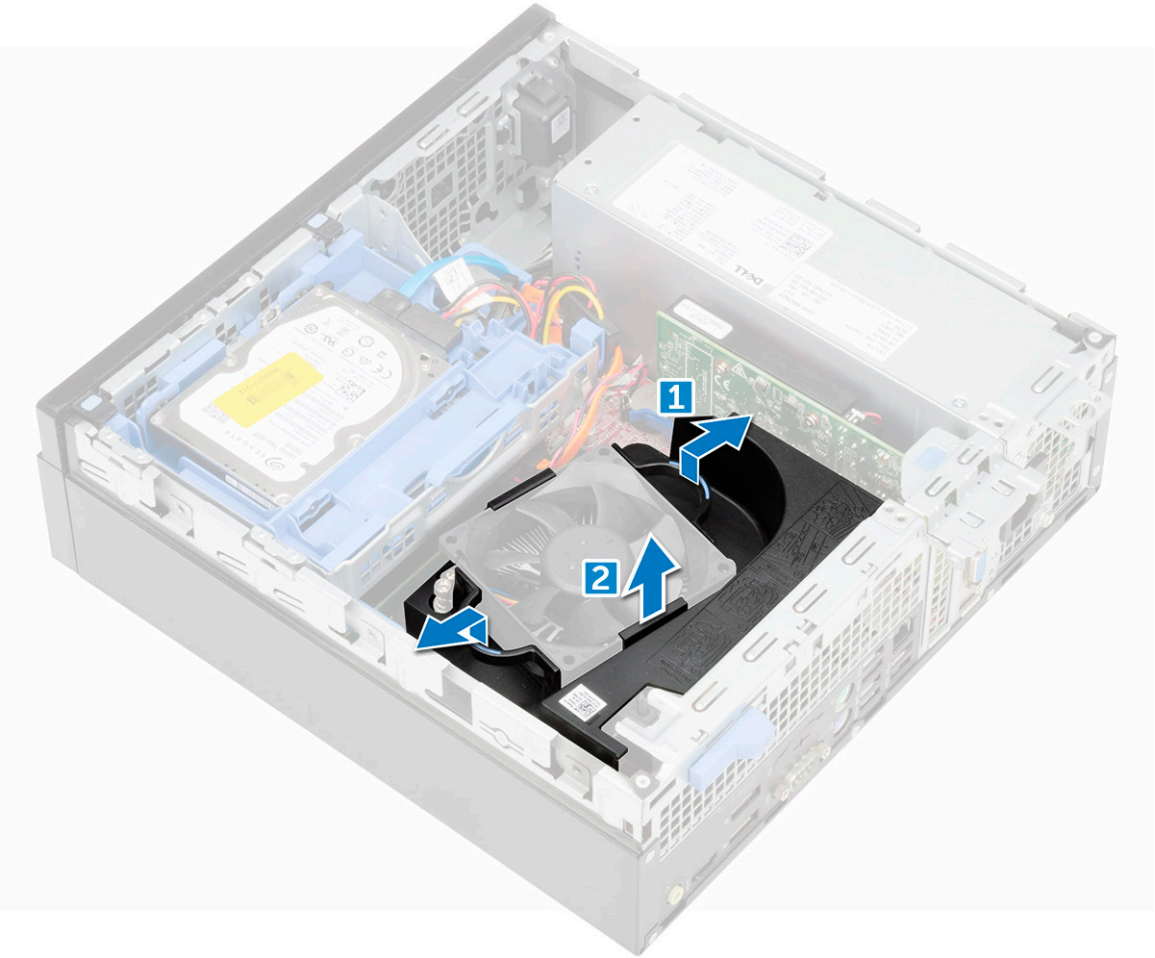
Heat sink

Removing heat sink assembly

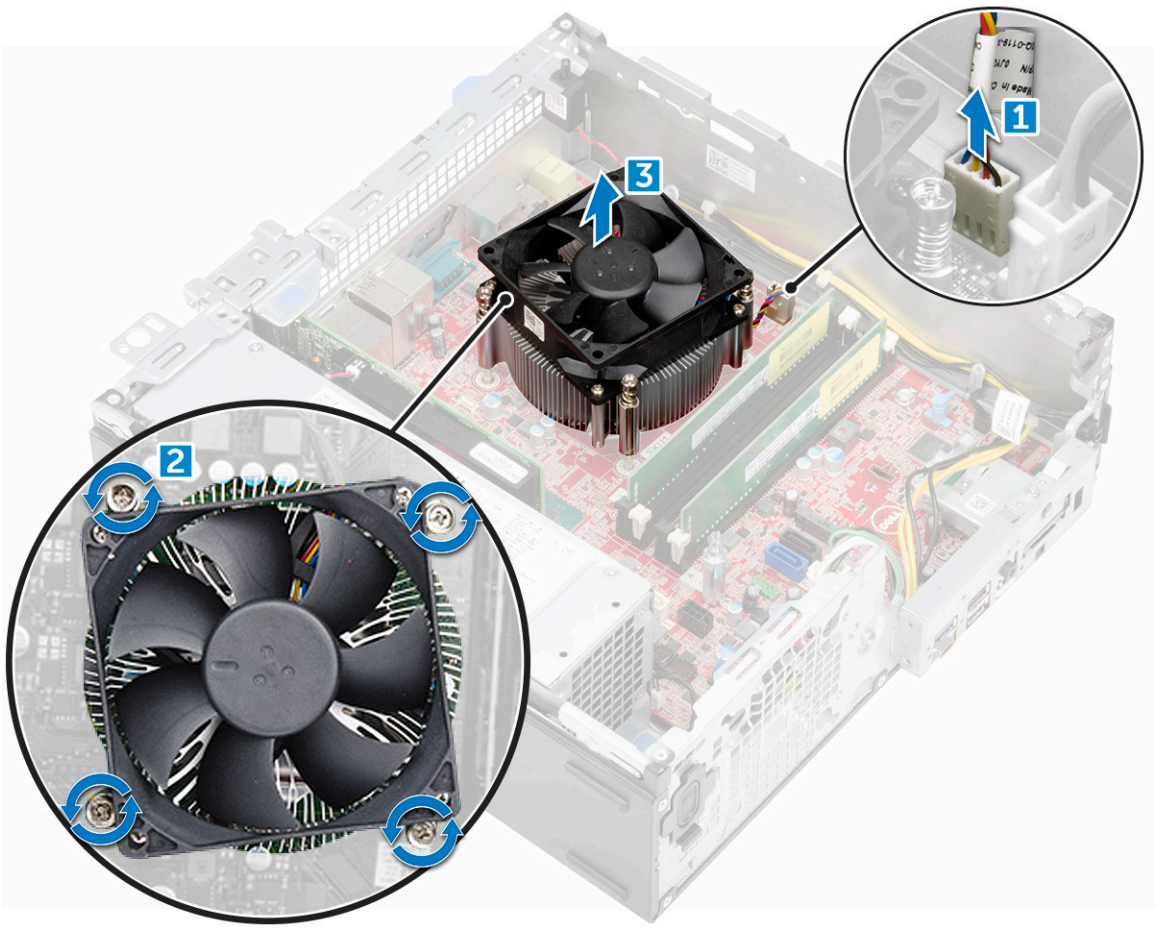
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
   d. optical drive
3. To remove the fan duct:
   a. Pry the retention clips in opposite directions [1].
   b. Lift and remove the fan duct from the computer [2].



4. To remove the heat sink assembly:
   a. Disconnect the heat sink assembly cable from the system board [1].
   b. Loosen the captive screws that secure the heat sink assembly [2] and lift it away from the computer [3].



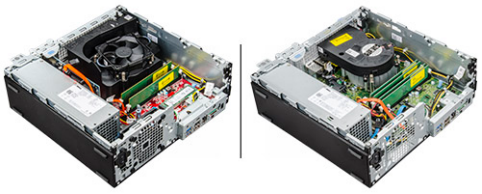
Installing the heat sink assembly

1. Place the heat sink assembly onto the processor.
2. Tighten the captive screws to secure the heat sink assembly to the system board.
3. Connect the heat sink assembly cable to the system board.
4. Install the:
   a. optical drive
   b. 2.5–inch drive assembly
   c. bezel
   d. cover
5. Follow the procedure in After working inside your computer.

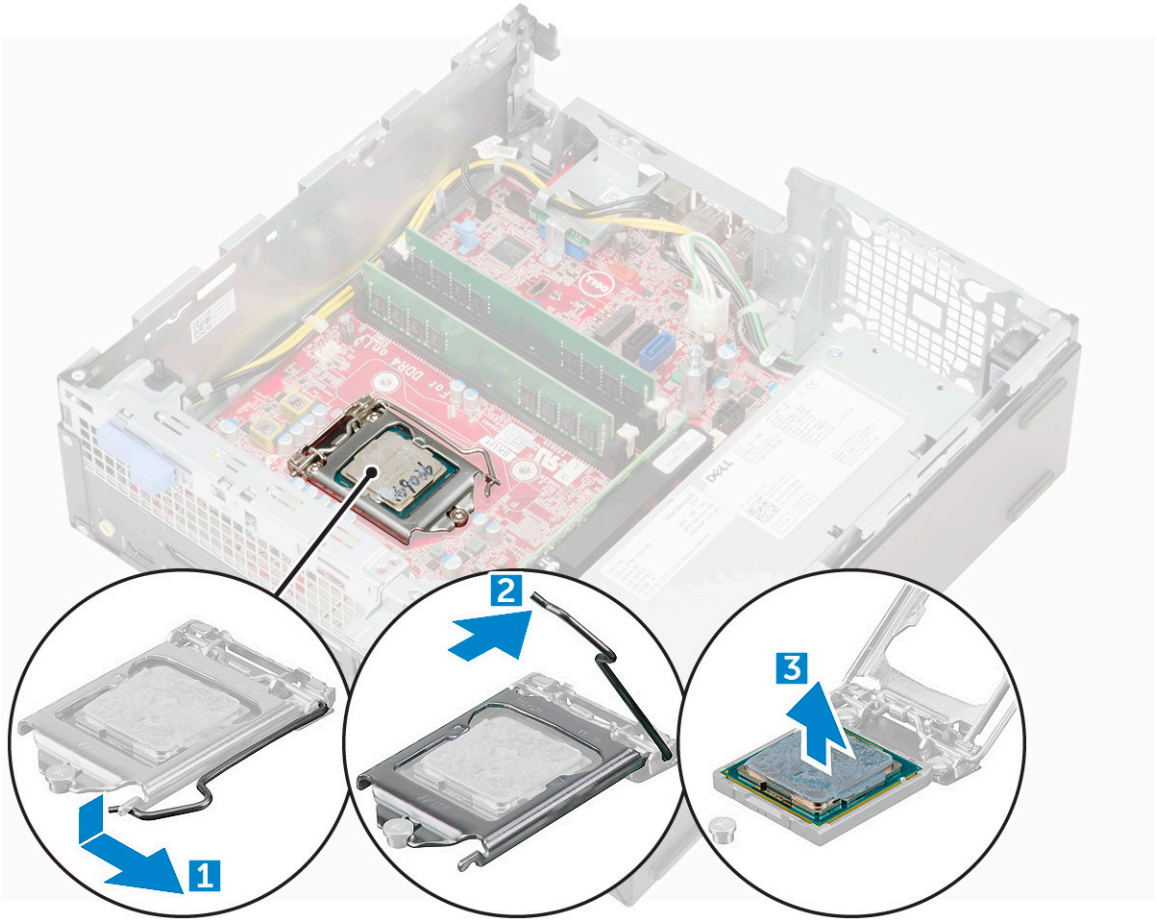
Processor

Removing processor

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. 2.5–inch drive assembly
   c. Optical drive
   d. heat sink assembly
3. To remove the processor:
   a. Release the socket lever by pushing the lever down and out from under the tab on the processor shield [1].
   b. Lift the lever upward and lift the processor shield [2].
   c. Lift the processor out of the socket [3].



Installing the processor

1. Align the processor with the socket keys.
2. Align the pin-1 indicator of the processor with the triangle on the socket.
3. Place the processor on the socket such that the slots on the processor align with the socket keys.
4. Close the processor shield by sliding it under the retention screw.
5. Lower the socket lever and push it under the tab to lock it.
6. Install the:

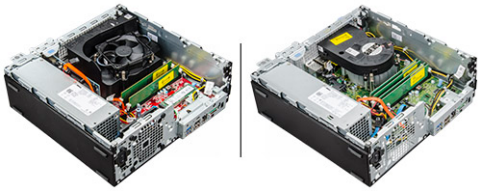
a. heat sink assembly
b. optical drive
c. 2.5–inch drive assembly
d. cover

7. Follow the procedure in After working inside your computer.

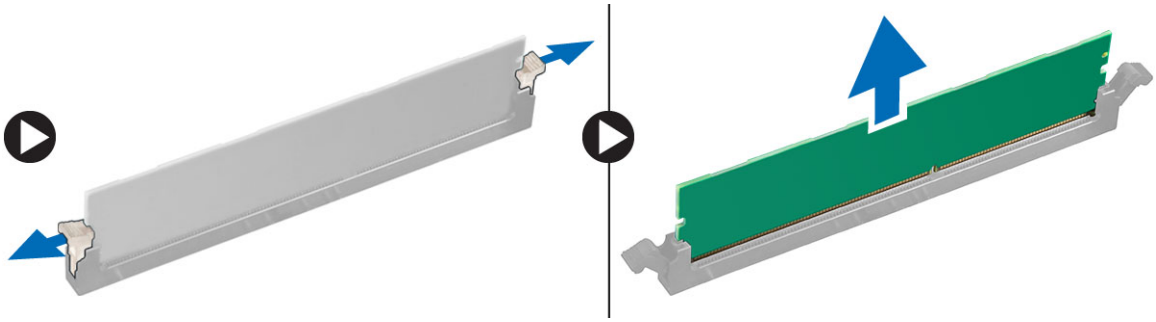
Memory module

Removing memory module

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
   d. optical drive
3. To remove the memory module:
   a. Push the memory module retention tabs on both sides of the memory module.
   b. Lift the memory module from the memory module connector on the system board.



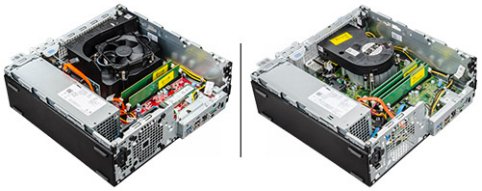
Installing the memory module

1. Align the notch on the memory module with the tab on the memory module connector.
2. Insert the memory module into the memory module socket.
3. Press the memory module until the memory module retention tabs click into place.
4. Install the:
   a. optical drive
   b. 2.5–inch drive assembly
   c. bezel
   d. cover
5. Follow the procedure in After working inside your computer.

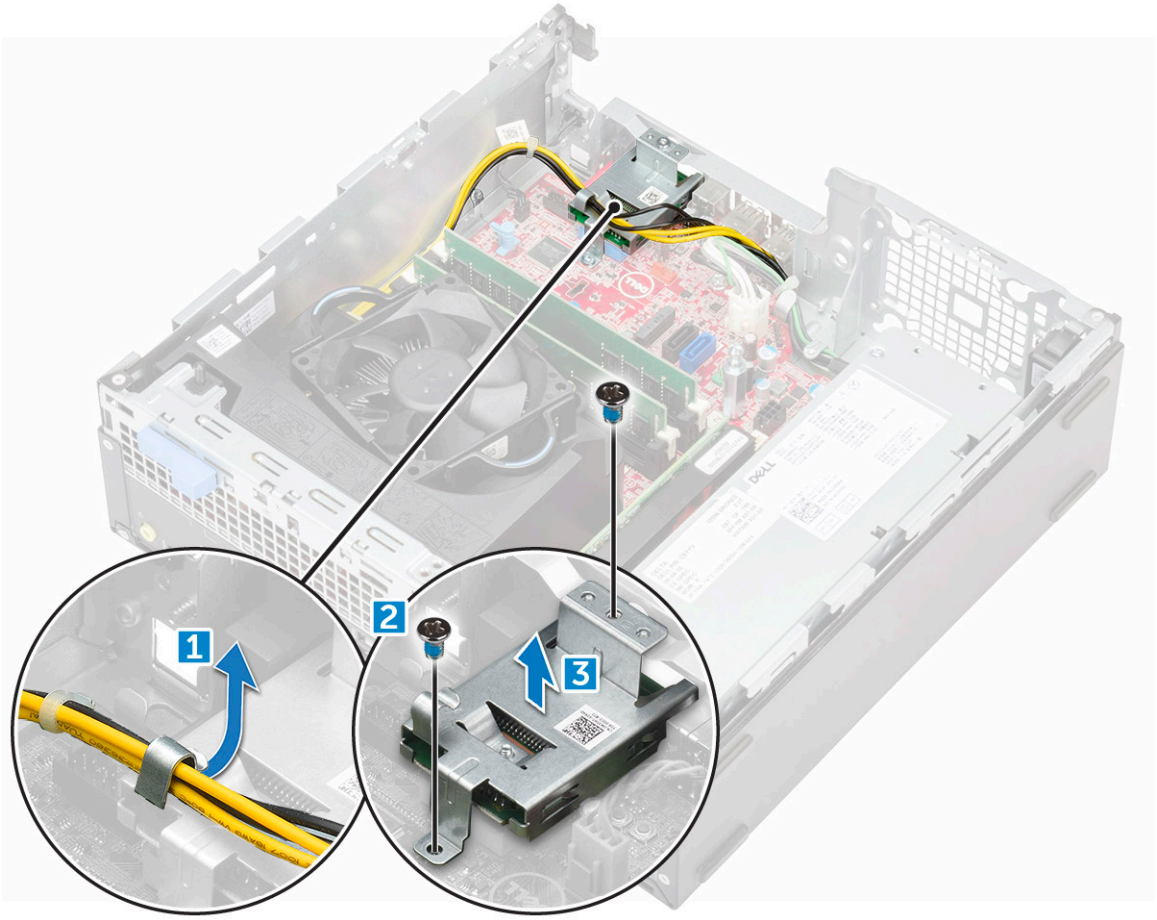
SD card reader

Removing the SD card reader

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
   d. optical drive
   e. M.2 PCIe SSD
3. To remove the SD card reader:
   a. Release the power supply unit cables from the retention clips on the SD card reader enclosure [1].
   b. Remove the screws that secure the SD card reader and lift it away from the computer [2] [3].



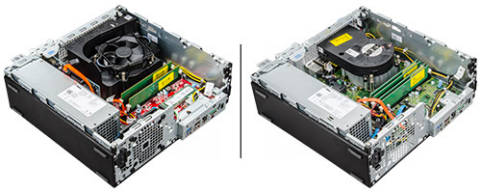
Installing the SD card reader

1. Place the SD card reader on the chassis.
2. Tighten the screws that secure the SD card reader to the computer.
3. Install the:
   a. M.2 PCIe SSD
   b. optical drive
   c. 2.5–inch drive assembly
   d. bezel
   e. cover
4. Follow the procedure in After working inside your computer.

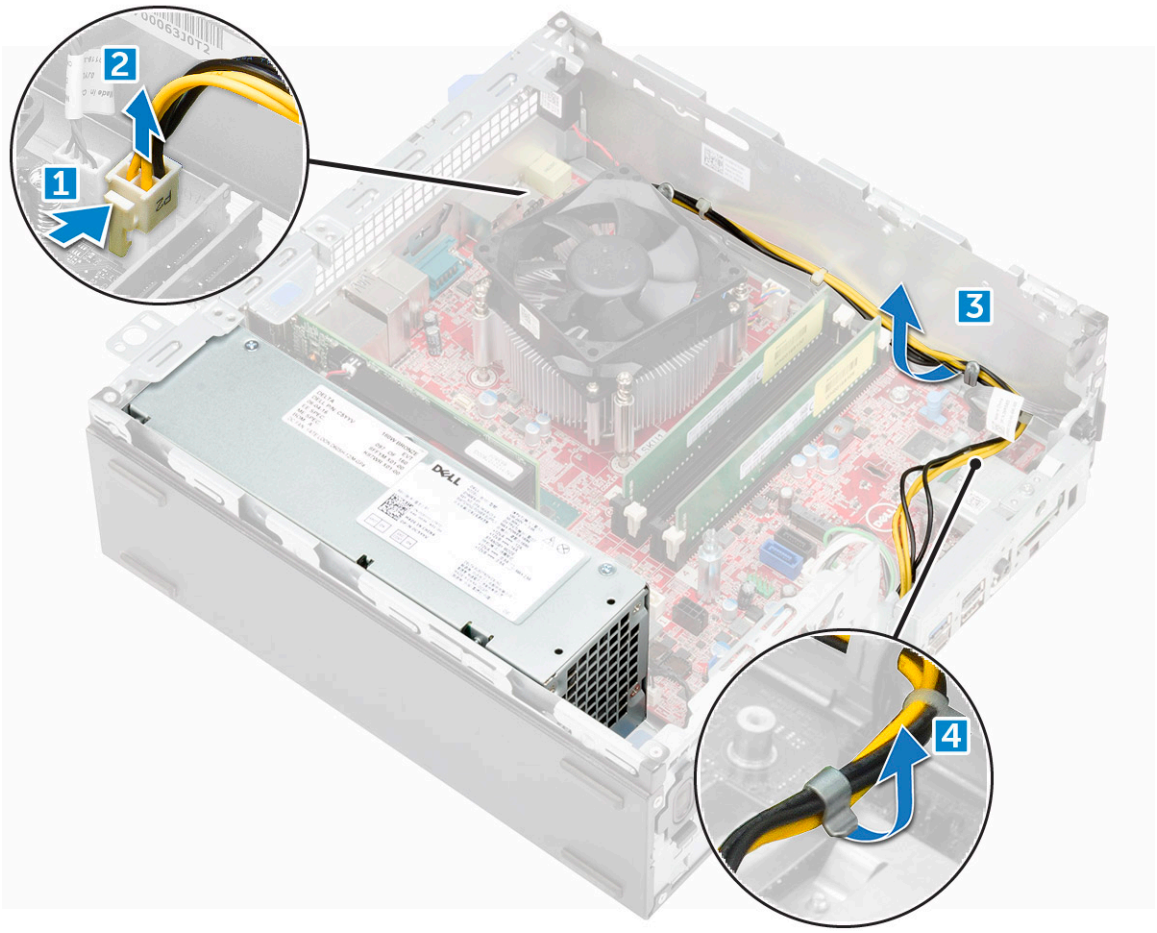
Power supply unit

Removing power supply unit or PSU

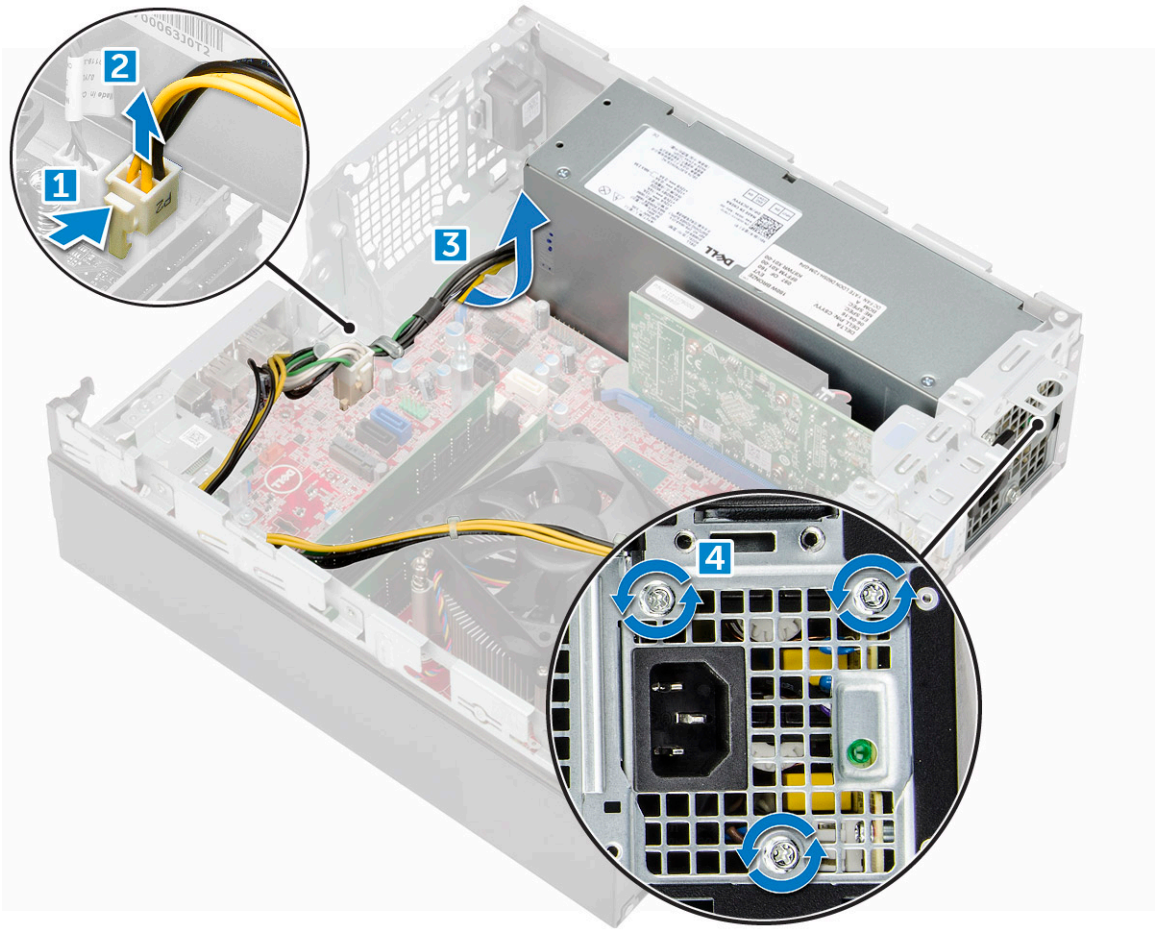
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



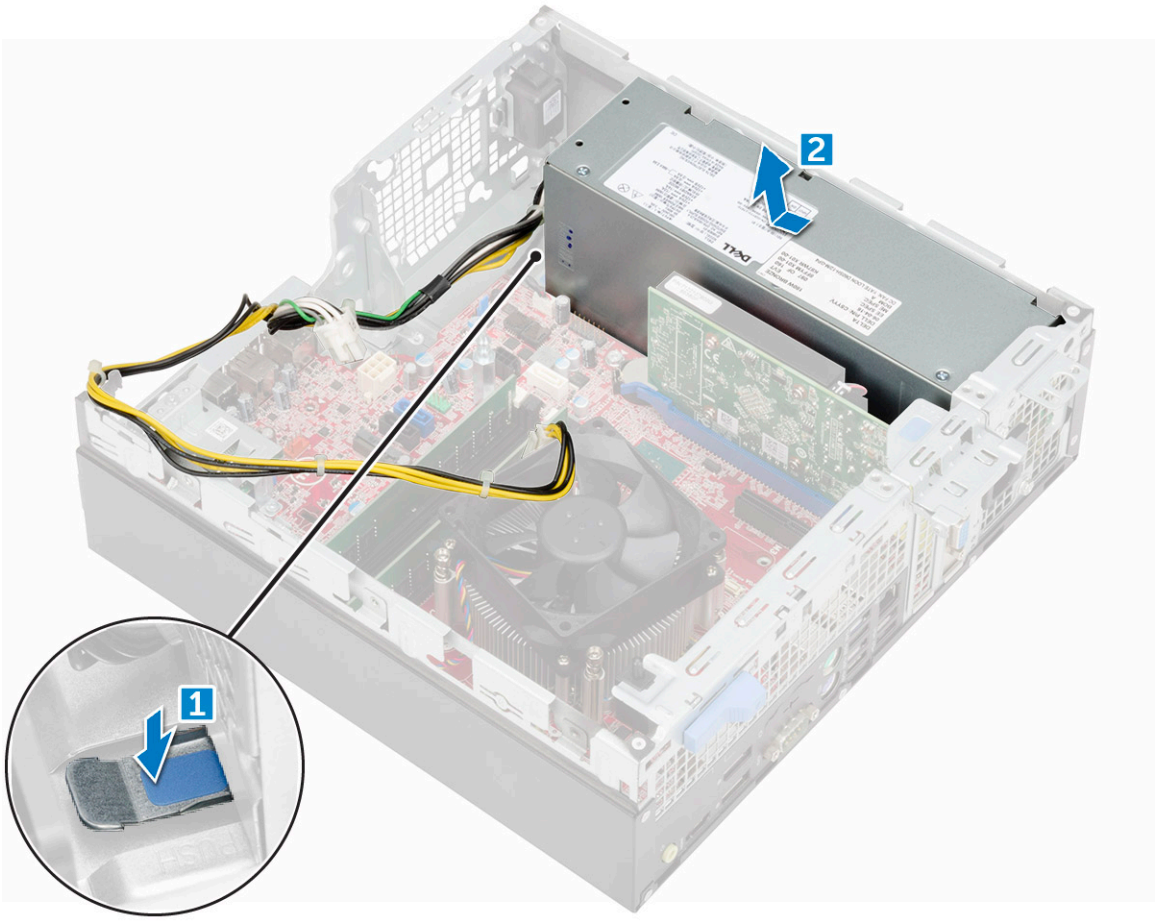
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
   d. optical drive
3. To release the PSU:
   a. Disconnect the power cable from the system board [1] [2].
   b. Unroute the power cables from the retention clips on the chassis [3] [4].



4. To remove the PSU:
   a. Disconnect the power cable from the system board [1] [2].
   b. Lift the cables away from the computer [3].
   c. Remove the screws that secure the PSU to the computer [4].



5. Press the blue release tab [1], slide the PSU and lift it away from the computer [2].



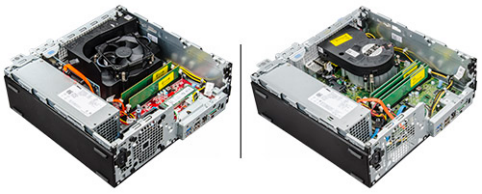
Installing the power supply unit or PSU

1. Insert the PSU in the chassis and slide it toward the back of the computer to secure it.
2. Tighten the screws to secure the PSU to the back of the computer.
3. Route the PSU cables through the retention clips.
4. Connect the power cables to the system board.
5. Install the:
   a. optical drive
   b. 2.5–inch drive assembly
   c. bezel
   d. cover
6. Follow the procedure in After working inside your computer.

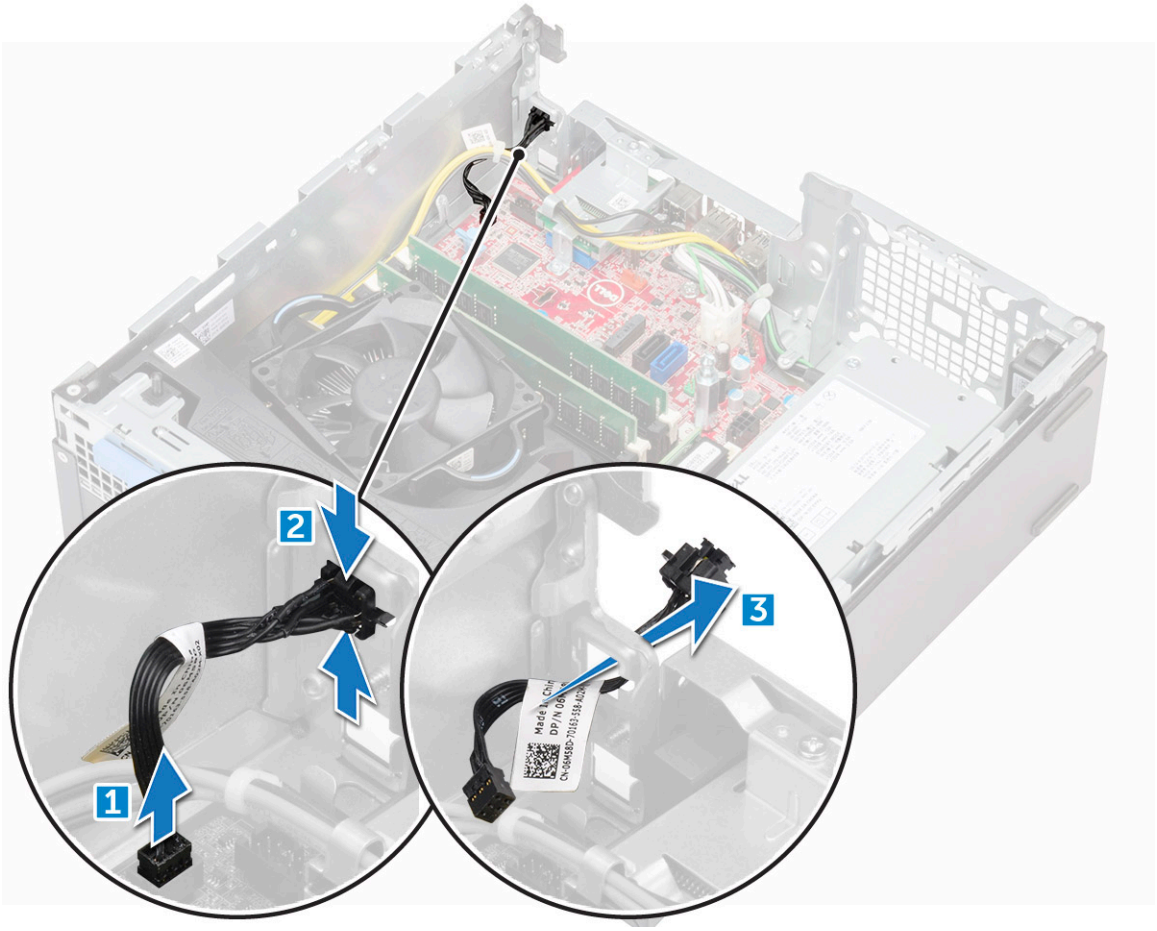
Power switch

Removing power switch

NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. drive assembly
   d. optical drive
3. To remove the power switch:
   a. Disconnect the power switch cable from the system board [1].
   b. Press the power switch retention tabs and pull out from the computer [2] [3].



Installing the power switch

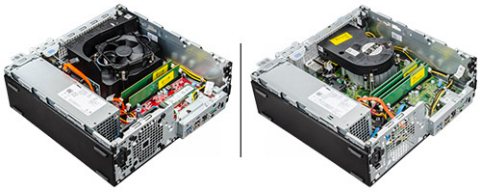
1. Slide the power switch module into the slot on the chassis until it clicks into place.
2. Connect the power switch cable to the connector on the system board.
3. Install the:
   a. drive assembly
   b. optical drive
   c. bezel
   d. cover

4. Follow the procedure in After working inside your computer.

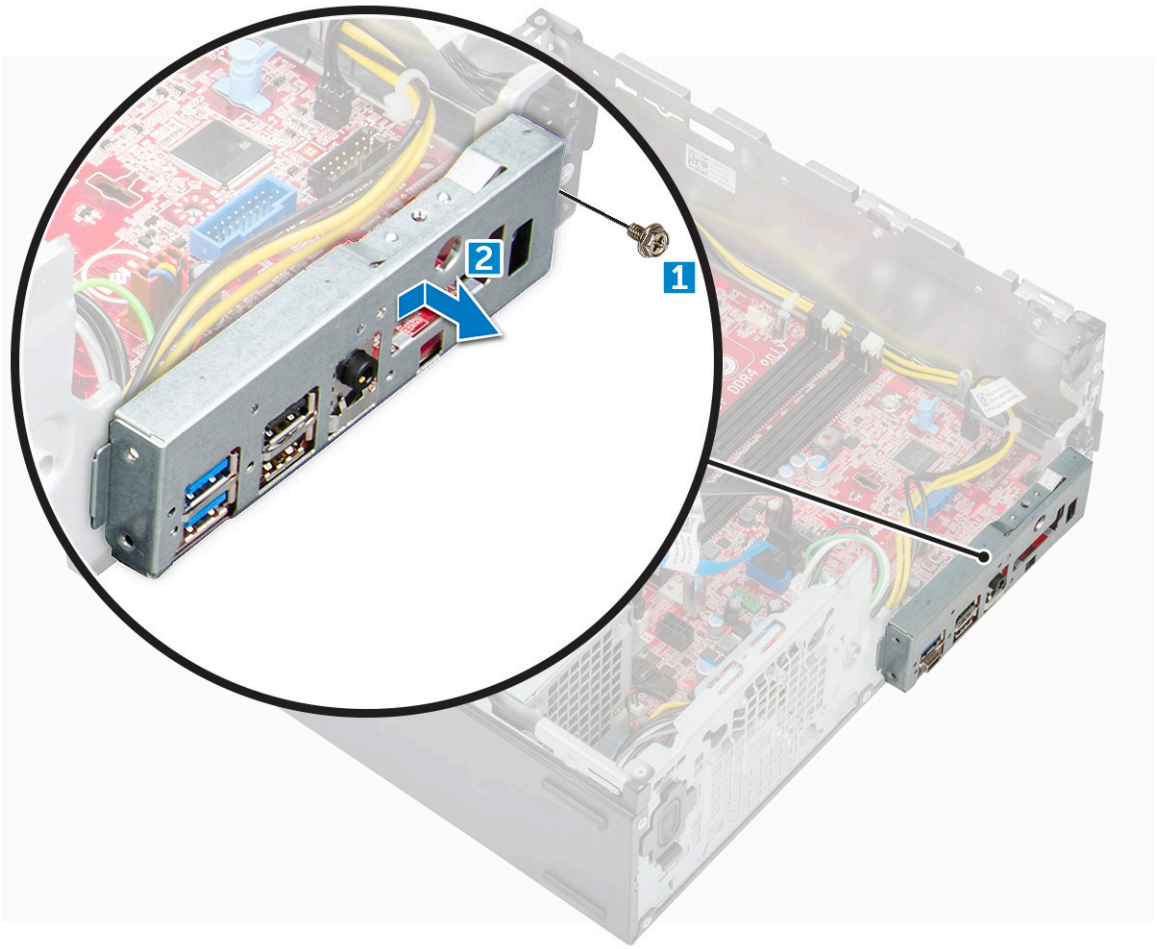
System board

Removing system board

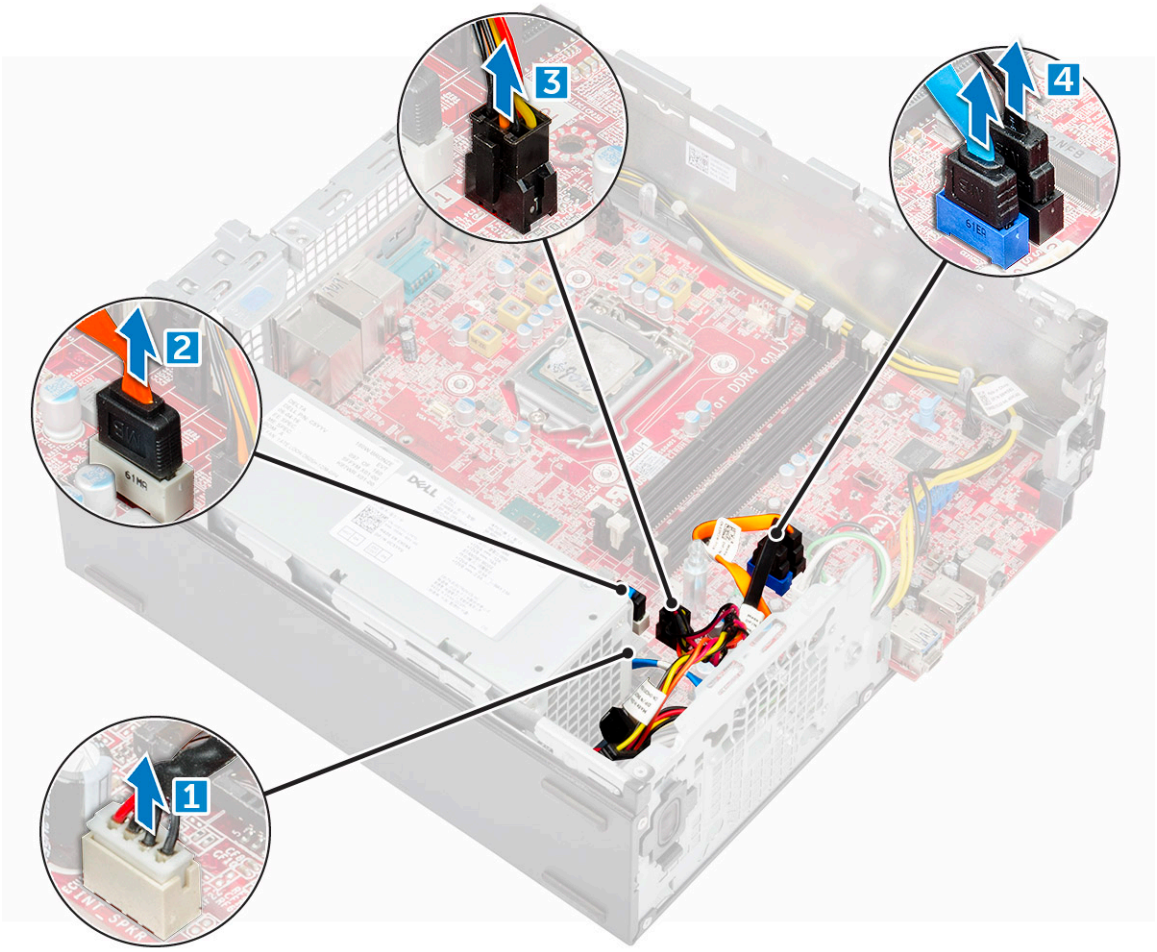
NOTE: Depending on the configuration you order, you may see either of the heat sinks as shown in the image below.



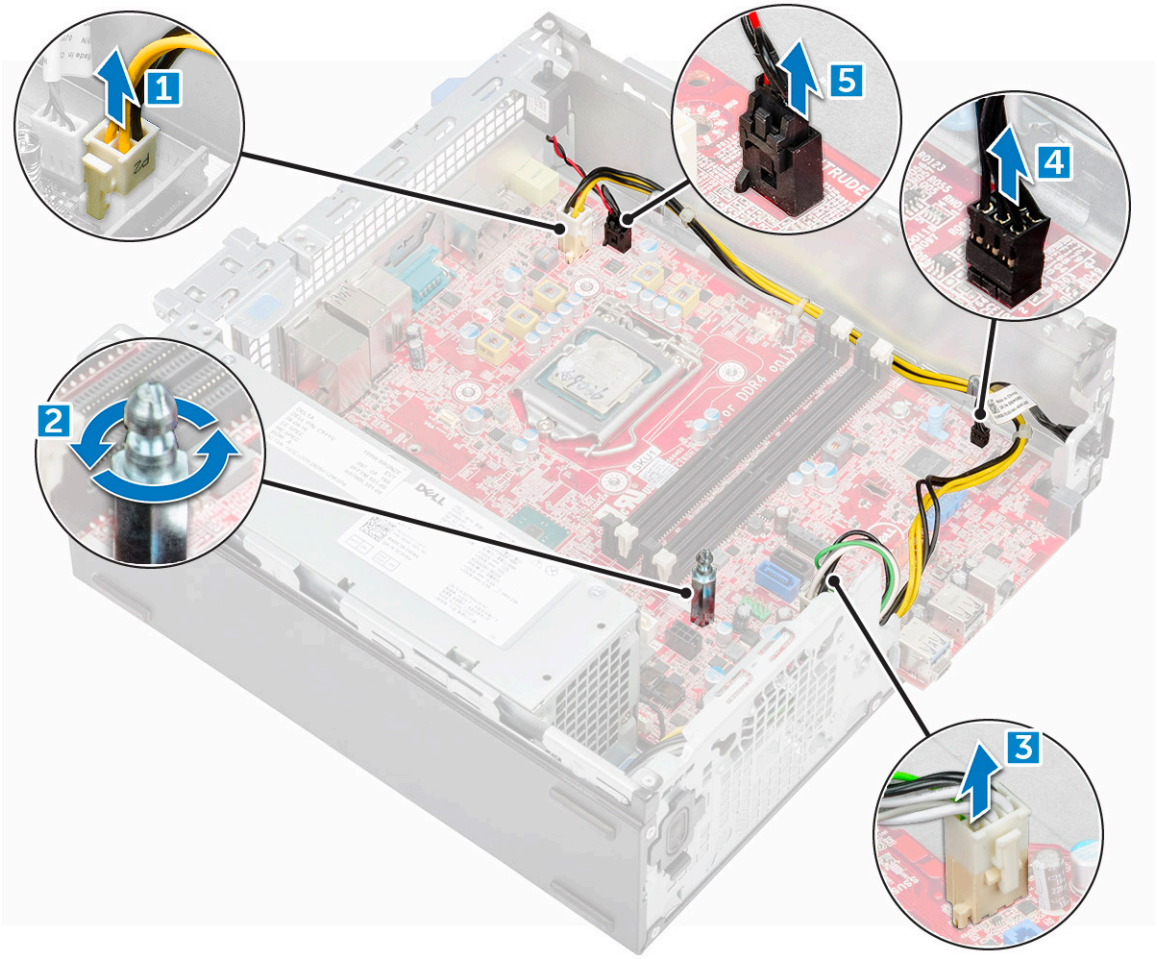
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. cover
   b. bezel
   c. 2.5–inch drive assembly
   d. optical drive
   e. heat sink
   f. processor
   g. expansion card
   h. memory module
   i. M.2 PCIe SSD
   j. SD card reader
3. To remove the I/O panel:
   a. Remove the screw that secures the I/O panel [1].
   b. Slide and push toward the front from the computer [2].



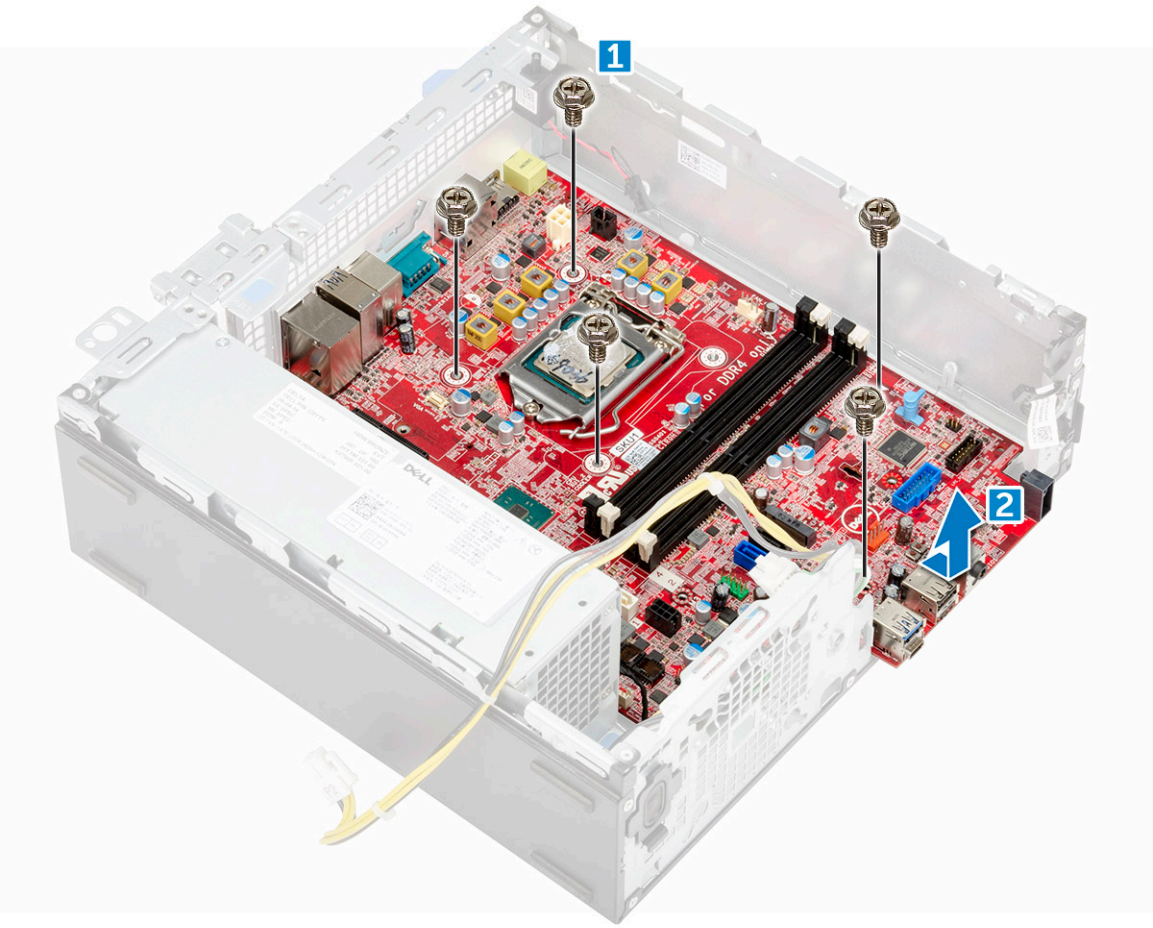
4. Disconnect the following cables from the system board:
   a. speaker [1]
   b. 2.5–inch drive [2]
   c. optical drive [3]
   d. Data cable [4]



5. Disconnect the following cables and screw from the system board:
   a. PSU [1]
   b. hard drive and optical drive caddy stand off screw [2]
   c. PSU [3]
   d. power switch [4]
   e. intrusion switch [5]



6. To remove the system board:
   a. Remove the screws that secure the system board to the computer [1].
   b. Slide and lift the system board away from the computer [2].



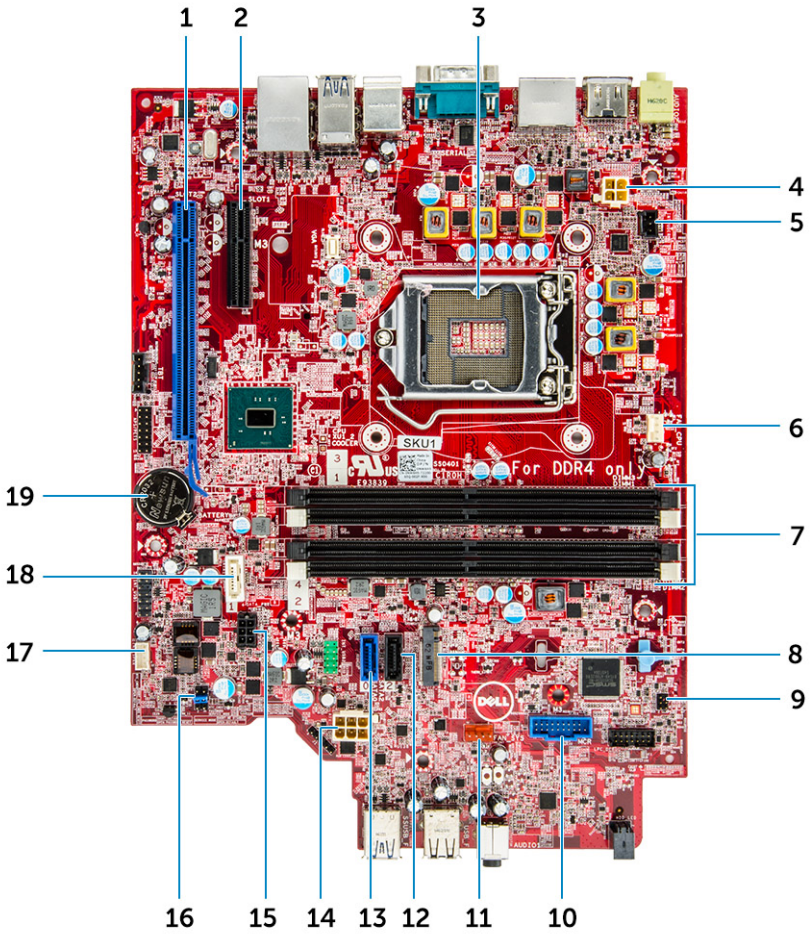
Installing the system board

1. Hold the system board by its edges and align it toward the back of the computer.
2. Lower the system board into the computer until the connectors at the back of the system board align with the slots on the chassis, and the screw holes on the system board align with the standoffs on the computer.
3. Tighten the screws to secure the system board to the computer.
4. Route all the cables through the routing clips.
5. Align the cables with the pins on connectors on the system board and connect the following cables to the system board:
   a. intrusion switch
   b. optical drive
   c. hard drive
   d. PSU
   e. power switch
   f. intrusion switch
   g. speaker
6. Install the:
   a. SD card reader
   b. M.2 PCIe SSD
   c. memory module
   d. expansion card
   e. processor
   f. optical drive
   g. 2.5–inch drive assembly
   h. heat sink
   i. bezel

j. cover

7. Follow the procedure in After working inside your computer.

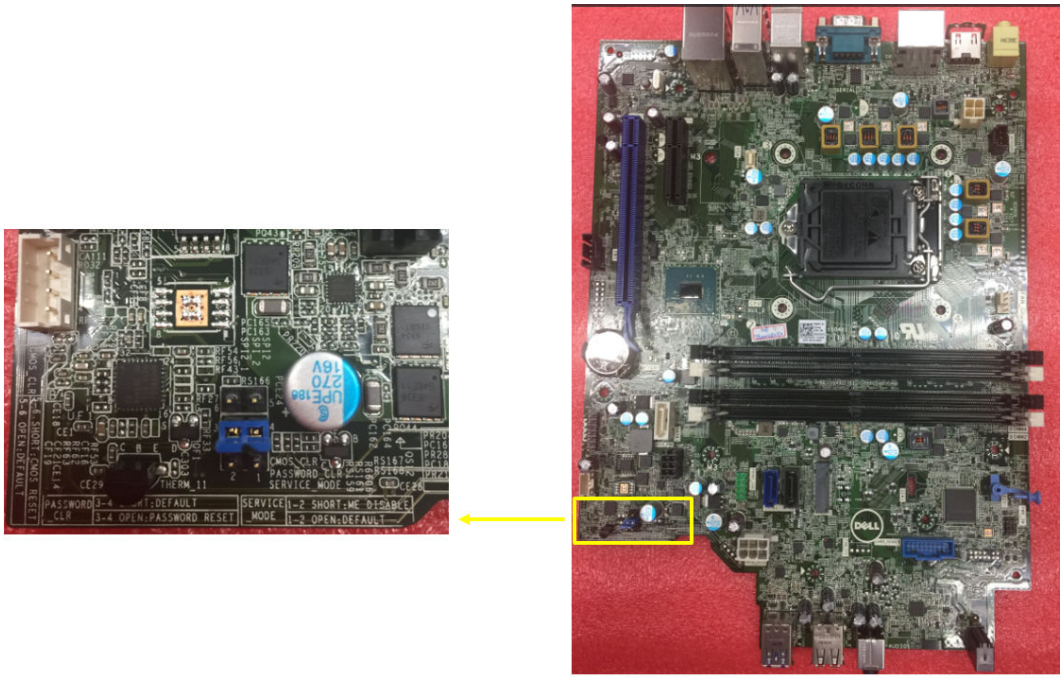
System board layout



1. PCI-e x16 connector (slot 2)
2. PCI-e x4 connector (slot 1)
3. Processor connector (CPU)
4. CPU power connector
5. Intrusion switch connector
6. CPU fan connector
7. Memory module connectors
8. M.2 Slot 3 Connector
9. Power switch connector
10. Media card reader connector
11. VGA daughter board connector
12. SATA 2 connector
13. SATA 0 connector
14. ATX power connector
15. HDD and ODD power cable connector
16. Service mode jumper
17. Speaker connector
18. SATA 1 connector
19. Coin cell battery

System board jumper

The service system board jumper must be set to **Password** to function normally. As long as the jumper stays at Service Mode, all values set in the BIOS will not be saved and the system will not exit the manufacturing mode with an error prompt indicating that jumpers are incorrect.


CMOS_CLR
PASSWORD_CLR
SERVICE_MODE
PASSWORD _CLR
SERVICE _MODE
THERM_11

3

M.2 Intel Optane Memory Module 16 GB

Topics:

Overview

This document describes the specifications and capabilities of the Intel® Optane™ memory module. The Intel® Optane™ memory is a system acceleration solution developed for 7th Generation Intel® Core™ processor-based platforms. The Intel® Optane™ memory module is architected with the high performance controller interface Non-Volatile Memory Express (NVMe*)- delivering outstanding performance, low latency and quality of service. NVMe uses a standardized interface that enables higher performance and lower latency than pervious interfaces. Intel® Optane™ memory module offers capacities of 16 GB and 32 GB in small M.2 form factors.

The Intel® Optane™memory module offers a system acceleration solution using the latest Intel® Rapid Storage Technology (Intel® RST) 15.5X.

The Intel® Optane™ memory module includes these key features:

- PCIe 3.0x2 with NVMe interface
- Uses Intel's revolutionary new storage technology, 3D Xpoint™ memory media
- Ultra-low latency; exceptional responsiveness
- Performance saturation at queue depth of 4 and lower
- Very high endurance capabilities

Intel®Optane™ Memory Module Driver Requirements

The following table describes the driver requirements for the Intel® Optane™ memory system acceleration us a component of Intel® Rapid Storgae Technology 15.5 or later and requires 7th generation Intel® Core ™ processor-based platforms to function.

Table 1. Driver Support

Support Level	Operating System Description
Intel® Optane™ Memory with System Acceleration Configuration Using Rapid Storage Technology Driver[1]	Windows 10*64 bit

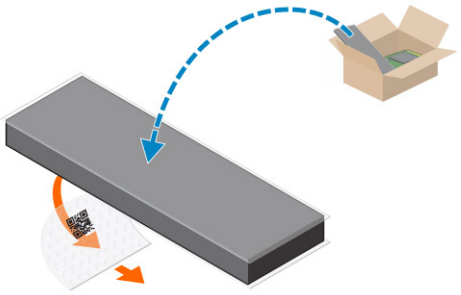
NOTES:

1. Intel® RST driver requires device to be attached to RST enabled PCIe lanes on 7th generation Intel® Core™.

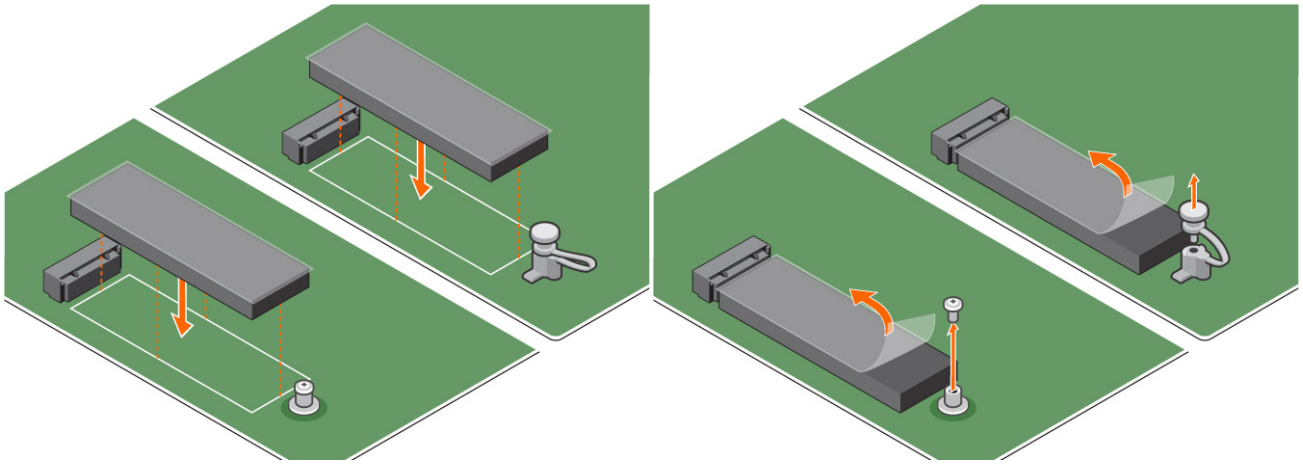
M.2 Intel Optane Memory Module 16 GB

1. Follow the procedure in Before working inside your computer.
2. Remove the cover.
3. To remove M.2 Intel optane memory module:

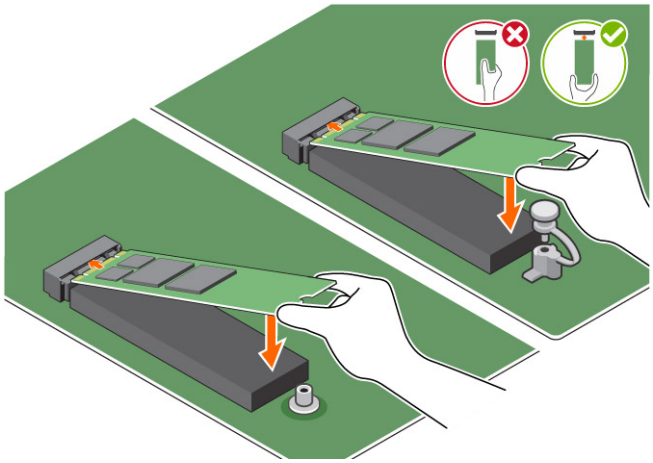
a. Remove the thermal pad and white adhesive tape from the box.



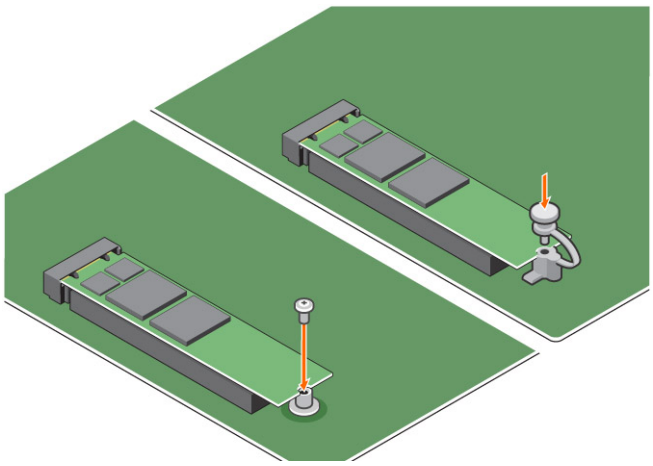
b. Place the thermal pad on the SSD slot and remove the white adhesive tape.



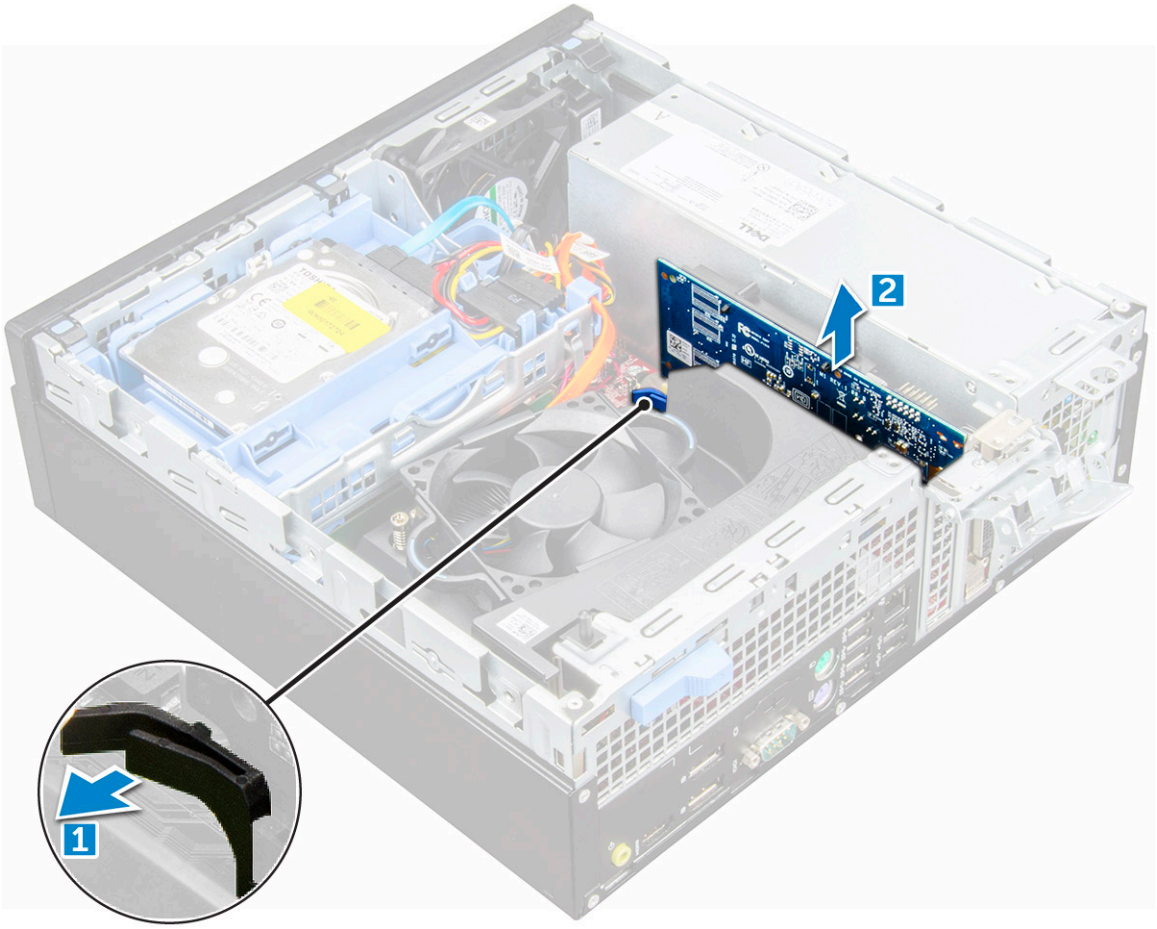
c. Place the M.2 Intel optane memory module into the slot on the thermal pad.



d. If the system is shipped with screw tighten that secures the M.2 Intel optane memory module on the computer. If the system is shipped with self locking spacer press to lock the M.2 Intel optane to secure on the computer.



4. To remove the expansion card:
   a. Pull the release tab at the base of the expansion card [1].
   b. Disconnect and lift the expansion card away from the connector [2].



Product specifications

Table 2. Product specifications

Features	Specification
Capacities	16 GB, 32 GB
Expansion cards	PCIe 3.0 x 2

Table 2. Product specifications (continued)

Features	Specification
M.2 form factors (all densities)	2280–S3–B-M
Performace	• Seq R/W: Up to 1350/290 MS/s • QD4 4HB Random Read: 240K + IOPs • QD4 4HB Random Write: 240K + IOPs
Latency (average sequential)	• Read 8.25 µ • Write: 30 µ
Components	• Intel 3D XPoint Memory Media • Intel Controller and Firmware • PCIe 3.0x2 with NVMe Interface • Intel Rapid Storage Technology 15.2 or later
Operating System Support	Windows 10 64 bit
Supported Platforms	7th generation or newer Intel Core processor based platforms
Power	• 3.3V Supply Rail • Active: 3.5 W • Drive Idel :900mW to 1.2W
Compliance	• NVMe Express 1.1 • PCI Express Base specifiation rev 3.0 • PCI M.2 HS Spec
Certification and Declarationsµ	UL, CE, C-Tick, BSMI, KCC, Microsoft WHQL, Microsoft WHCK, VCCI
Endurance Rating	• 100 GB Writes per day • Upto 182.3 TBW (Terabytes written)
Temperature Specification	• Operating: 0 to 70º C • Non-Opearting: 10 to 85º C • Temperature monitoring
Shock	1500 G/0.5msec
Vibration	• Operating: 2.17 G_{RMs}(5–800Hz) • Non-Operating: 3.13 G_{RMS} (5–800Hz)
Altitude (Simulated)	• Operating: –1,000 ft to 10,000 ft • Non-Operating: –1,000 ft to 40,000 ft
Product Ecological Compliance	RoHS
Reliability	• Uncorrectable Bit Error Rate (UBER): 1 sector per 10^{15} bits read • Mean Time Between Failure (MTBF): 1.6 million hours

Environmental Conditions

Table 3. Temperature, Shock, Vibration

Temperature	M.2 2280 form factor
Operating[1] Non-operating [2]	0–70º C -10–85º C
Temperature Gradient[3] Operating	30º C/hr (Typical)

Table 3. Temperature, Shock, Vibration (continued)

Temperature	M.2 2280 form factor
Non-operating	30º C/hr (Typical)
Humidity Operating Non-operating	 5–95% 5–95%
Shock and Vibration	Range
Shock [4] Operating Non-operating	 1500 G / 0.5 ms 230 G / 3 msec
Vibration[5] Operating Non-operating	 2.17 G_{RMS} (5–800Hz) Max 3.13 G_{RMS} (5–800Hz) Max

NOTES:

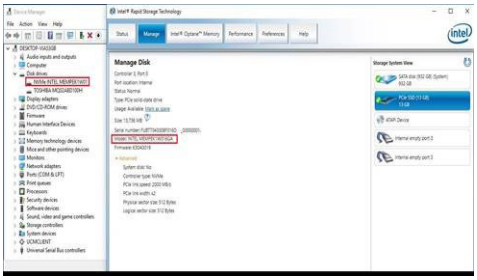
1. Operating temperature is targeted for 70º C.
2. Please contact your Intel representative for details on the non-operating temperature range.
3. Temperature gradient measured without condensation.
4. Shock specification assume the device is mounted securely with the input vibration applied to the drive-mounting screws. Stimulus may be applied in the X,Y, or Z axis and shock specification is measured using Root Mean Squared (RMS) value.
5. Vibration specifications assume the device is mounted securely with the input vibration applied to the drive-mounting screws. Stimulus may be applied in the X, Y, or Z axis. Vibration specificities is measured using RMS value.

Troubleshooting

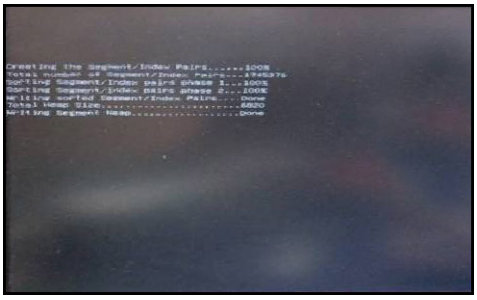
1. The Intel Optane Memory model name "NVME INTEL MEMPEK1W01" in Device Manager does not match in the Intel Rapid Storage Technology user interface; it only shows a part of the serial number information. This is a known issue and does not impede the functionality of the Intel Optane Memory.

   Device Manager: NVME INTEL MEMPEK1W01

   IRST UI: INTEL MEMPEK1W016GA

2. During the first-time boot up, the system will scan the pairing status as below screen shot after shutdown. It's working as designed and the message will not appear again in following boot ups.


Creating the Segment/Index Pairs.....100%
Total number of Segment/Index Pairs:...1745275
Sorting Segment/Index pairs phase 1...100%
Sorting Segment/Index pairs phase 2...100%
Writing sorted Segment/Index Pairs.... Done
Total Heap Size.....4820
Writing Segment Heap.....Done

4

Technology and components

Topics:

USB features

Universal Serial Bus, or USB, was introduced in 1996. It dramatically simplified the connection between host computers and peripheral devices like mice, keyboards, external drivers, and printers.

Table 4. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 2.0	480 Mbps	High Speed	2000
USB 3.0/USB 3.1 Gen 1	5 Gbps	SuperSpeed	2010
USB 3.1 Gen 2	10 Gbps	SuperSpeed	2013

USB 3.0/USB 3.1 Gen 1 (SuperSpeed USB)

For years, the USB 2.0 has been firmly entrenched as the de facto interface standard in the PC world with about 6 billion devices sold, and yet the need for more speed grows by ever faster computing hardware and ever greater bandwidth demands. The USB 3.0/USB 3.1 Gen 1 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.1 Gen 1 features are as follows:

- Higher transfer rates (up to 5 Gbps)
- Increased maximum bus power and increased device current draw to better accommodate power-hungry devices
- New power management features
- Full-duplex data transfers and support for new transfer types
- Backward USB 2.0 compatibility
- New connectors and cable

The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

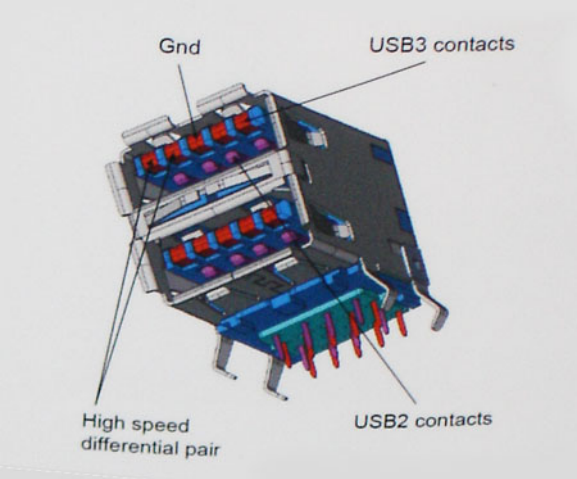
Speed

Currently, there are 3 speed modes defined by the latest USB 3.0/USB 3.1 Gen 1 specification. They are Super-Speed, Hi-Speed and Full-Speed. The new SuperSpeed mode has a transfer rate of 4.8 Gbps. While the specification retains Hi-Speed, and Full-Speed USB mode, commonly known as USB 2.0 and 1.1 respectively, the slower modes still operate at 480 Mbps and 12 Mbps respectively and are kept to maintain backward compatibility.

USB 3.0/USB 3.1 Gen 1 achieves the much higher performance by the technical changes below:

- An additional physical bus that is added in parallel with the existing USB 2.0 bus (refer to the picture below).

- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.0/USB 3.1 Gen 1 adds four more for two pairs of differential signals (receive and transmit) for a combined total of eight connections in the connectors and cabling.
- USB 3.0/USB 3.1 Gen 1 utilizes the bidirectional data interface, rather than USB 2.0's half-duplex arrangement. This gives a 10-fold increase in theoretical bandwidth.



With today's ever increasing demands placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, making data transfer at around 320 Mbps (40 MB/s) — the actual real-world maximum. Similarly, USB 3.0/USB 3.1 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400MB/s with overheads. At this speed, USB 3.0/USB 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.0/USB 3.1 Gen 1 opens up the laneways and provides more headroom for devices to deliver a better overall experience. Where USB video was barely tolerable previously (both from a maximum resolution, latency, and video compression perspective), it's easy to imagine that with 5-10 times the bandwidth available, USB video solutions should work that much better. Single-link DVI requires almost 2Gbps throughput. Where 480Mbps was limiting, 5Gbps is more than promising. With its promised 4.8Gbps speed, the standard will find its way into some products that previously weren't USB territory, like external RAID storage systems.

Listed below are some of the available SuperSpeed USB 3.0/USB 3.1 Gen 1 products:

- External Desktop USB 3.0/USB 3.1 Gen 1 Hard Drives
- Portable USB 3.0/USB 3.1 Gen 1 Hard Drives
- USB 3.0/USB 3.1 Gen 1 Drive Docks & Adapters
- USB 3.0/USB 3.1 Gen 1 Flash Drives & Readers
- USB 3.0/USB 3.1 Gen 1 Solid-state Drives
- USB 3.0/USB 3.1 Gen 1 RAIDs
- Optical Media Drives
- Multimedia Devices
- Networking
- USB 3.0/USB 3.1 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0/USB 3.1 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0/USB 3.1 Gen 1 specifies new physical connections and thus new cables to take advantage of the higher speed capability of the new protocol, the connector itself remains the same rectangular shape with the four USB 2.0 contacts in the exact same location as before. Five new connections to carry receive and transmitted data independently are present on USB 3.0/USB 3.1 Gen 1 cables and only come into contact when connected to a proper SuperSpeed USB connection.

HDMI 1.4

This topic explains the HDMI 1.4 and its features along with the advantages.

HDMI (High-Definition Multimedia Interface) is an industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any compatible digital audio/video source, such as a DVD player, or A/V receiver and a compatible digital audio and/or video monitor, such as a digital TV (DTV). The intended applications for HDMI TVs, and DVD players. The primary advantage is cable reduction and content protection provisions. HDMI supports standard, enhanced, or high-definition video, plus multichannel digital audio on a single cable.

NOTE: The HDMI 1.4 will provide 5.1 channel audio support.

HDMI 1.4 Features

- **HDMI Ethernet Channel** - Adds high-speed networking to an HDMI link, allowing users to take full advantage of their IP-enabled devices without a separate Ethernet cable
- **Audio Return Channel** - Allows an HDMI-connected TV with a built-in tuner to send audio data "upstream" to a surround audio system, eliminating the need for a separate audio cable
- **3D** - Defines input/output protocols for major 3D video formats, paving the way for true 3D gaming and 3D home theater applications
- **Content Type** - Real-time signaling of content types between display and source devices, enabling a TV to optimize picture settings based on content type
- **Additional Color Spaces** - Adds support for additional color models used in digital photography and computer graphics
- **4K Support** - Enables video resolutions far beyond 1080p, supporting next-generation displays that will rival the Digital Cinema systems used in many commercial movie theaters
- **HDMI Micro Connector** - A new, smaller connector for phones and other portable devices, supporting video resolutions up to 1080p
- **Automotive Connection System** - New cables and connectors for automotive video systems, designed to meet the unique demands of the motoring environment while delivering true HD quality

Advantages of HDMI

- Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
- Low -cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner
- Audio HDMI supports multiple audio formats from standard stereo to multichannel surround sound
- HDMI combines video and multichannel audio into a single cable, eliminating the cost, complexity, and confusion of multiple cables currently used in A/V systems
- HDMI supports communication between the video source (such as a DVD player) and the DTV, enabling new functionality

5

BIOS setup

CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not be displayed.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Topics:

BIOS overview

The BIOS manages data flow between the computer's operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

Entering BIOS setup program

1. Turn on your computer.
2. Press F2 immediately to enter the BIOS setup program.

   NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Then, turn off your computer and try again.

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Table 5. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.

Table 5. Navigation keys (continued)

Keys	Navigation
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. **NOTE:** For the standard graphics browser only.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

One Time Boot menu

To enter **One Time Boot menu**, turn on your computer, and then press F12 immediately.

NOTE: It is recommended to shutdown the computer if it is on.

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive (if available)

  NOTE: XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

The boot sequence screen also displays the option to access the System Setup screen.

System Setup options

NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.

Table 6. General

Option	Description
System Information	Displays the following information: • System Information: Displays **BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date,** and the **Express Service Code**. • Memory Information: Displays **Memory Installed, Memory Available, Memory Speed, Memory Channel Mode, Memory Technology, DIMM 1 Size**, and **DIMM 2 Size**, **DIMM 3 Size**, and **DIMM 4 Size**. • PCI Information: Displays SLOT1, SLOT2, SLOT3, SLOT4, and SLOT5_M.2 • Processor Information: Displays **Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable,** and **64-Bit Technology.**

Table 6. General (continued)

Option	Description
	• Device Information: Displays **SATA-0, SATA-1, SATA-2, SATA-3, SATA-4, M.2 PCIe SSD-0, LOM MAC Address, Video Controller, and Audio Controller.** .
Boot Sequence	Allows you to specify the order in which the computer attempts to find an operating system from the devices specified in this list. • Legacy • UEFI (selected by default)
Advanced Boot Options	Allows you to select the Enable Legacy Option ROMs option, when in UEFI boot mode. By default, this option is selected.
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.

Table 7. System Configuration

Option	Description
Integrated NIC	Allows you to control the on-board LAN controller. The option 'Enable UEFI Network Stack' is not selected by default. The options are: • Disabled • Enabled • Enabled w/PXE (default) **NOTE:** Depending on the computer and its installed devices, the items listed in this section may or may not appear.
SATA Operation	Allows you to configure the operating mode of the integrated hard drive controller. • Disabled = The SATA controllers are hidden • RAID ON = SATA is configured to support RAID mode (selected by default) • AHCI= SATA is configured for AHCI mode
Serial Port	Allows you to determine how the built-in serial port to operate. The options are: • Disabled • COM 1 – Default setting • COM 2 • COM 3 • COM 4
Drives	Allows you to enable or disable the various drives on-board: • SATA-0 • SATA-1 • SATA-2 • SATA-3 • SATA-4
Smart Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. The **Enable Smart Reporting option** is disabled by default.
USB Configuration	Allows you to enable or disable the integrated USB controller for: • Enable Boot Support • Enable Front USB Ports

Table 7. System Configuration (continued)

Option	Description
	• Enable Rear USB Ports All the options are enabled by default.
Front USB Configuration	Allows you to enable or disable the front USB ports. All the ports are enabled by default.
Rear USB Configuration	Allows you to enable or disable the back USB ports. All the ports are enabled by default.
USB PowerShare	This option allows you to charge the external devices, such as mobile phones, music player. This option is disabled by default.
Audio	Allows you to enable or disable the integrated audio controller. The option **Enable Audio** is selected by default. • Enable Microphone • Enable Internal Speaker Both the options are selected by default.
Miscellaneous	Allows you to enable or disable the various on-board devices. • Enable PCI Slot (default option) • Enable Media Card (default option) • Disable Media Card

Table 8. Video

Option	Description
Primary Display	Allows you to select the primary display when multiple controllers are available in the system. • Auto (default) • Intel HD Graphics **NOTE:** If you do not select Auto, the on-board graphics device will be present and enabled.

Table 9. Security

Option	Description
Admin Password	Allows you to set, change, and delete the admin password.
System Password	Allows you to set, change, and delete the system password.
Internal HDD-0 Password	Allows you to set, change, and delete the computer's internal HDD.
Internal HDD-3 Password	Allows you to set, change, and delete the computer's internal HDD. **NOTE:** HDD passwords are not available for PCI-e hard drives.
Strong Password	This option lets you enable or disable strong passwords for the system.
Password Configuration	Allows you to control the minimum and maximum number of characters allowed for a administrative password and the system password. The range of characters is between 4 and 32.
Password Bypass	This option lets you bypass the System (Boot) Password and the internal HDD password prompts during a system restart.

Table 9. Security (continued)

Option	Description
	• Disabled — Always prompt for the system and internal HDD password when they are set. This option is selected by default. • Reboot Bypass — Bypass the password prompts on Restarts (warm boots). **NOTE:** The system will always prompt for the system and internal HDD passwords when powered on from the off state (a cold boot). Also, the system will always prompt for passwords on any module bay HDDs that may be present.
Password Change	This option lets you determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set. **Allow Non-Admin Password Changes** - This option is enabled by default.
UEFI Capsule Firmware Updates	This option controls whether this system allows BIOS updates via UEFI capsule update packages. This option is selected by default. Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS)
TPM 2.0 Security	Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system. • TPM On (default) • Clear • PPI Bypass for Enable Commands • PPI Bypass for Disable Commands • Attestation Enable (default) • Key Storage Enable(default) • SHA-256(default) • Disabled • Enabled (default)
Computrace	This field lets you Activate or Disable the BIOS module interface of the optional Computrace Service from Absolute Software. Enables or disables the optional Computrace service designed for asset management. • **Deactivate** - This option is selected by default. • Disable • Activate
Chassis Intrusion	Allows you to control the chassis intrusion feature. You can set this option to: • Enabled • Disabled (default) • On-Silent
CPU XD Support	Allows you to enable or disable the Execute Disable mode of the processor. This option is enabled by default.
OROM Keyboard Access	This option determines whether users are able to enter Option ROM Configuration screens via hotkeys during boot. Specifically, these settings are capable of preventing access to Intel RAID (CTRL+I) or Intel Management Engine BIOS Extension (CTRL+P/F12). • Enable (selected by default)— User may enter OROM configuration screens via the hotkey.

Table 9. Security (continued)

Option	Description
	• One-Time Enable — User may enter OROM configuration screens via the hotkeys on next boot only. After next boot, the setting will revert to disabled. • Disable — User may not enter OROM configuration screens via the hotkey.
Admin Setup Lockout	Allows you to enable or disable the option to enter Setup when an Administrative password is set. This option is not set by default.

Table 10. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable Secure Boot feature • Disable (selected by default) • Enable
Expert key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: • PK (default) • KEK • db • dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: • **Save to File**- Saves the key to a user-selected file • **Replace from File**- Replaces the current key with a key from a user-selected file • **Append from File**- Adds a key to the current database from a user-selected file • **Delete**- Deletes the selected key • **Reset All Keys**- Resets to default setting • **Delete All Key**s- Deletes all the keys **NOTE:** If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.

Table 11. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	Allows you to enable or disable the Intel Software Guard Extensions to provide a secured environment for running code/storing sensitive information in the context of the main operating system. • Disabled (default) • Enabled
Enclave Memory Size	Allows you to set the Intel SGX Enclave Reserve Memory Size. • 32 MB • 64 MB (Disabled by default) • 128 MB (Disabled by default)

Table 12. Performance

Option	Description
Multi Core Support	This field specifies whether the process will have one or all cores enabled. This option is enabled by default. options: ● All (selected by default) ● 1 ● 2 ● 3
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of the processor. This option is enabled by default.
C States Control	Allows you to enable or disable additional processor sleep states. This option is enabled by default.
Limited CPUID Value	Allows you to limit the maximum value of the processor standard CPUID function. This option is disabled by default.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. This option is enabled by default.

Table 13. Power Management

Option	Description
AC Recovery	Determines how the system responds when AC power is re-applied after a power loss. You can set the AC Recovery to: ● Power Off ● Power On ● Last Power State This option is Power Off by default.
Auto On Time	Sets time to automatically turn on the computer. Time is kept in standard 12-hour format (hour:minutes:seconds). Change the startup time by typing the values in the time and AM/PM fields. **NOTE:** This feature does not work if you turn off your computer using the switch on a power strip or surge protector or if **Auto Power is set to disabled**.
Deep Sleep Control	Allows you to define the controls when Deep Sleep is enabled. ● Disabled ● Enabled in S5 only ● Enabled in S4 and S5 This option is **Enabled in S4 and S5** by default.
Fan Control Override	Allows you to determine the speed of the system fan. When this option is enabled, the system fan runs at the maximum speed. This option is disabled by default.
USB Wake Support	Allows you to enable the USB devices to wake the computer from standby (S1 / S3), Hibernate (S4), and Power Off (S5) modes. The option "Enable USB Wake Support" is selected by default
Wake on LAN/WWAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. This feature only works when the computer is connected to AC power supply. ● **Disabled** - Does not allows the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN.

Table 13. Power Management (continued)

Option	Description
	• **LAN** or **WLAN** - Allows the system to be powered on by special LAN or wireless LAN signals. • **LAN Only** - Allows the system to be powered on by special LAN signals. • **LAN with PXE Boot** - A wakeup packet sent to the system in either the S4 or S5 state, that will cause the system to wake-up and immediately boot to PXE. • **WLAN Only** - Allows the system to be powered on by special WLAN signals. This option is Disabled by default.
Block Sleep	Allows you to block entering to sleep (S3 state) in OS environment. This option is disabled by default.
Intel Ready Mode	Allows you to enable the capability of Intel Ready Mode Technology. This option is disabled by default.

Table 14. POST Behavior

Option	Description
Numlock LED	Allows you to enable or disable the Numlock feature when your computer starts. This option is enabled by default.
Keyboard Errors	Allows you to enable or disable the keyboard error reporting when the computer starts. This option is disabled by default.
Fast Boot	This option can speed up the boot process by bypassing some compatibility steps: • Minimal — The system boots quickly, unless the BIOS has been updated, memory changed, or the previous POST did not complete. • Thorough — The system does not skip any steps in the boot process. • Auto — This allows the operating system to control this setting (this works only when the operating system supports Simple Boot Flag). This option is set to **Minimal** by default.

Table 15. Manageability

Option	Description
USB provision	This option is not selected by default.
MEBx Hotkey	This option is selected by default.

Table 16. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel® Virtualization Technology. **Enable Intel Virtualization Technology** - This option is enabled by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. **Enable VT for Direct I/O** - This option is enabled by default.

Table 17. Maintenance

Option	Description
Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is set by default.
SERR Messages	Controls the SERR message mechanism. This option is set by default. Some graphics cards require that the SERR message mechanism be disabled.
BIOS Downgrade	Allows you to control flashing of the system firmware to the previous versions. This option is enabled by default. **NOTE:** If this option is not selected, the flashing of the system firmware to the previous versions is blocked.
Data Wipe	Allows you to securely erase the data from all the available internal storages, such as HDD, SSD, mSATA, and eMMC. The option Wipe on Next Boot is disabled by default.
BIOS recovery	Allows you to recover the corrupted BIOS conditions from the recovery files on the primary hard drive. The option **BIOS Recovery from Hard Drive** is selected by default

Table 18. System Logs

Option	Description
BIOS Events	Displays the system event log and allows you to: • Clear Log • Mark all Entries

Table 19. Advanced configurations

Option	Description
ASPM	Allows you to activate the state power management. • Auto (Default) • Disabled • L1 Only

Updating the BIOS

Updating the BIOS in Windows

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

   NOTE: If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.

6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, search in the Knowledge Base Resource at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article 000131486 at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, search in the Knowledge Base Resource at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 One-Time boot menu.

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.

BIOS Update

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F12 One-Time boot menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, then the BIOS supports this BIOS update option.

NOTE: Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

Updating from the One-Time boot menu

To update your BIOS from the F12 One-Time boot menu, you need the following:

- USB drive formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive
- AC power adapter that is connected to the computer
- Functional computer battery to flash the BIOS

Perform the following steps to perform the BIOS update flash process from the F12 menu:

CAUTION: Do not turn off the computer during the BIOS update process. The computer may not boot if you turn off your computer.

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the One-Time Boot Menu, select BIOS Update using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file**.
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS**. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS update is completed.

System and setup password

Table 20. System and setup password

Password type	Description
System password	Password that you must enter to log in to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

You can create a system password and a setup password to secure your computer.

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data that is stored on your computer if it is not locked and left unattended.

NOTE: System and setup password feature is disabled.

Assigning a system setup password

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

To enter the system setup, press F12 immediately after a power-on or reboot.

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

To enter the System Setup, press F12 immediately after a power-on or reboot.

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, update, or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

   NOTE: If you change the System and/or Setup password, reenter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

5. Press Esc and a message prompts you to save the changes.
6. Press Y to save the changes and exit from System Setup.
   The computer restarts.

Clearing CMOS settings

CAUTION: Clearing CMOS settings will reset the BIOS settings on your computer.

1. Remove the side cover.
2. Disconnect the battery cable from the system board.
3. Remove the coin-cell battery.
4. Wait for one minute.
5. Replace the coin-cell battery.
6. Connect the battery cable to the system board.
7. Replace the side cover.

Clearing BIOS (System Setup) and System passwords

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

NOTE: For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

6

Software

Topics:

Supported operating systems

The following list shows supported operating systems:

Table 21. Supported operating system

Supported operating systems	Operating System Description
Microsoft Windows	• Microsoft Windows 10 Home (64-bit) • Microsoft Windows 10 (64-bit) Professional • Microsoft Windows 7 (32/64 bit) Professional **NOTE:** Microsoft Windows 7 is not supported with the Intel 7th Generation processors.
Other	• Ubuntu 16.04 LTS • Neokylin V6.0
OS Media Support	• Optional RDVD drive

Downloading drivers

1. Turn on the computer.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the auto detect feature or manually browse for your computer model.
4. Click **Drivers and Downloads**.
5. Select the operating system installed on your computer.
6. Scroll down the page and select the driver to install.
7. Click **Download File** to download the driver for your computer.
8. Navigate to the folder where you saved the driver file, after the download is complete.
9. Double-click the driver file icon and follow the instructions on the screen.

Downloading the chipset driver

1. Turn on the computer.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.

NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.

4. Click **Drivers and Downloads**.
5. Select the operating system installed in your computer.
6. Scroll down the page, expand **Chipset**, and select your chipset driver.
7. Click **Download File** to download the latest version of the chipset driver for your computer.
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the chipset driver file icon and follow the instructions on the screen.

Intel chipset drivers

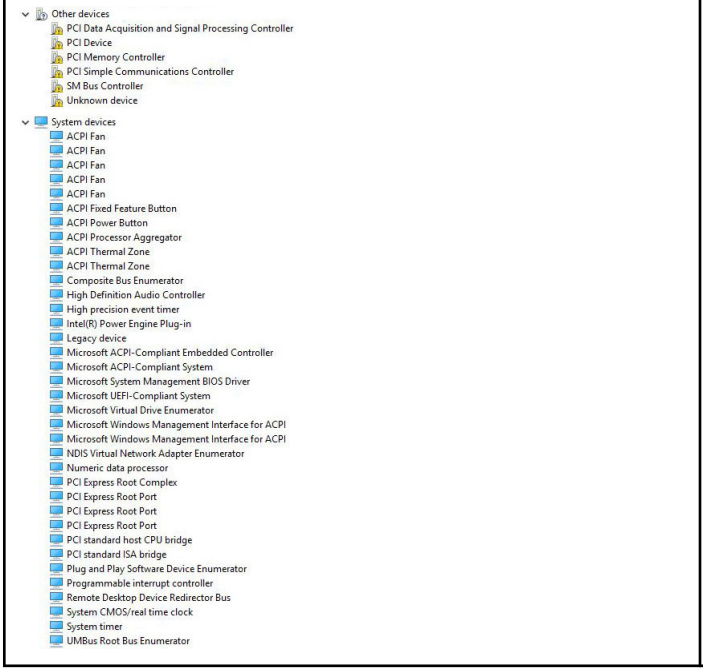
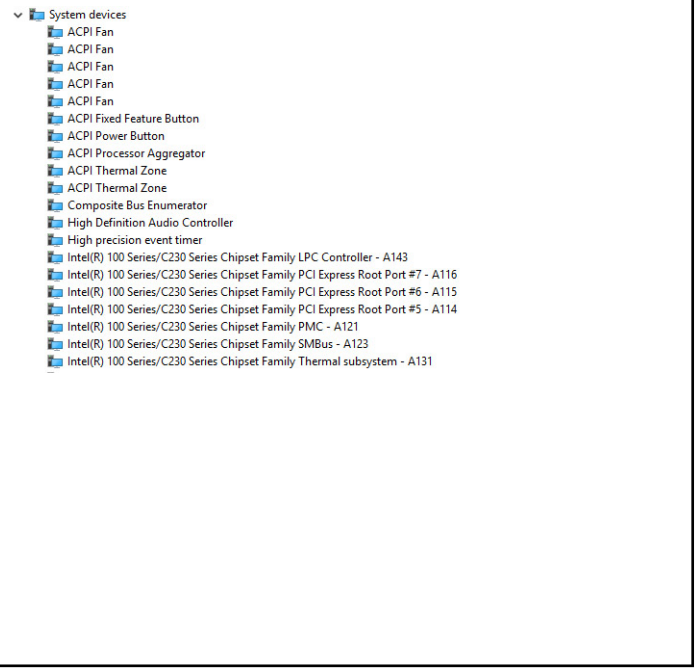
Verify if the Intel chipset drivers are already installed in the computer.

NOTE: Click **Start** > **Control Panel** > **Device Manager**

or

In Search the web and Windows, type **Device Manager**

Table 22. Intel chipset drivers

Before installation	After installation
	

Intel HD Graphics drivers

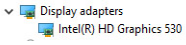
Verify if the Intel HD Graphics drivers are already installed in the computer.

NOTE: Click **Start** > **Control Panel** > **Device Manager.**

or

Tap Search the web and Windows and type **Device Manager**

Table 23. Intel HD Graphics drivers

Before installation	After installation
	

7

Troubleshooting your computer

You can troubleshoot your computer using indicators like diagnostic lights, beep codes, and error messages during the operation of the computer.

Topics:

Power-Supply Unit Built-in Self-Test

Built-in Self-Test (BIST) helps determine if the power-supply unit is working. To run self-test diagnostics on the power-supply unit of a desktop or all-in-one computer, search in the Knowledge Base Resource at www.dell.com/support.

Diagnostic and Power LED codes

Table 24. Power LED states

Power LED light status	Possible cause	Troubleshooting steps
Off	The computer is either turned off or is not receiving power or in Hibernation mode.	• Re-seat the power cable in the power connector on the back of the computer and the electrical outlet. • If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and is turned on. Also, bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly. • Ensure the electrical outlet is working by testing it with another device, such as a lamp.
Solid amber / blinking amber	The second state of the LED at power up, indicates that the POWER_GOOD signal is active and it is probable that the power supply is fine.	• Remove and reinstall any cards. • Remove and reinstall the graphics card, if applicable.

Table 24. Power LED states (continued)

Power LED light status	Possible cause	Troubleshooting steps
	Initial State of LED at power up. Refer to the table below for Blinking Amber pattern diagnostic suggestions and possible failures.	• Ensure the power cable is connected to the system board and processor.
Blinking white light	System is in a low power state, either S1 or S3. This does not indicate a fault condition.	• Press the power button to bring the computer out of the sleep mode. • Ensure all power cables are securely connected to the system board. • Ensure the main power cable and front panel cable are connected to the system board.
Steady white	The computer is fully functional and in the On state.	If the computer is not responding, do the following: • Ensure the display is connected and turned on. • If the display is connected and turned on, listen for a beep code.

NOTE: Amber LED blinking pattern : The pattern is 2 or 3 blinks followed by a short pause then X number of blinks up to 7. The repeated pattern has a long pause inserted in the middle. Example 2,3 = 2 amber blinks, short pause, 3 amber blinks followed by long pause then repeats.

Table 25. Diagnostic power LED codes

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
-	-	2 blinks > short pause > 1 blink > long pause > repeats	Bad Motherboard	Replace the motherboard
-	-	2 blinks > short pause > 2 blinks > long pause > repeats	Bad Motherboard, Power Supply or Power Supply cabling	If customer can assist to troubleshoot, narrow down the issue with PSU BIST Test, reseat cable. If nothing works, replace the motherboard, power supply or cabling
-	-	2 blinks > short pause > 3 blinks > long pause > repeats	Bad Motherboard, Memory or Processor	If customer can assist to troubleshoot, narrow down the issue by reseating memory and swapping an available known good memory. If nothing works, replace the motherboard, memory or processor

Table 25. Diagnostic power LED codes (continued)

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
-	-	2 blinks > short pause > 4 blinks > long pause > repeats	Bad coin cell battery	If customer can assist to troubleshoot, narrow down the issue by swapping a known good coin cell battery if available. If nothing works, replace the coin cell battery
S1	RCM	2 blinks > short pause > 5 blinks > long pause > repeats	BIOS Checksum Failure	System is in Recovery Mode. Flash latest BIOS version. If problem persists, replace the motherboard
S2	CPU	2 blinks > short pause > 6 blinks > long pause > repeats	Bad Processor	CPU configuration activity is in progress or a CPU failure was detected. Replace the processor
S3	MEM	2 blinks > short pause > 7 blinks > long pause > repeats	Memory failures	Memory subsystem configuration activity is in progress. Appropriate memory modules were detected but a memory failure has occurred. If customer can assist to troubleshoot, narrow down the issue with reseating memory and swapping a known good memory if available. If nothing works, replace the memory.
S4	PCI	3 blinks > short pause > 1 blinks > long pause > repeats	PCIe Device or Video subsystem failures	PCIe device configuration activity is in progress or PCIe device failure was detected. If customer can assist to troubleshoot, narrow down the issue by reseating PCIe card and removing one by one to determine which card failed. If identified the PCIe card failed, replace the PCIe Card. If none of the PCIe Cards failed, replace the motherboard.

Table 25. Diagnostic power LED codes (continued)

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
S5	VID	3 blinks > short pause > 2 blinks > long pause > repeats	Video Subsystem failure	Video subsystem configuration activity in progress or video subsystem failure. If customer can assist to troubleshoot, narrow down the issue by removing one by one to determine which card failed. If identified the card failed, replace the card. If none of the card failed, replace the motherboard.
S6	STO	3 blinks > short pause > 3 blinks > long pause > repeats	No Memory detected	If customer can assist to troubleshoot, narrow down the issue by removing one by one memory to determine which one failed and swapping to a known good memory if available to confirm. If identified the memory failed, replace the memory. If none of the memory failed, replace the motherboard.
S7	USB	3 blinks > short pause > 4 blinks > long pause > repeats	Storage Subsystem failure	Possible storage device configuration in progress or storage subsystem failure. If customer can assist to troubleshoot, narrow down the issue by removing one by one storages on motherboard to determine which one failed. If identified the storage failed, replace the storage. If identified the storage failed, replace the storage.
S8	MEM	3 blinks > short pause > 5 blinks > long pause > repeats	Memory configuration or incompatible error	Memory subsystem configuration activity is in progress. No memory modules were detected.

Table 25. Diagnostic power LED codes (continued)

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
				If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed. Also, combining the configuration to validate appropriate combination. If identified the component failed, replace the component. If none of the component failed, replace the motherboard.
S9	MBF	3 blinks > short pause > 6 blinks > long pause > repeats	System board failure	Fatal system board failure detected. If customer can assist to troubleshoot, narrow down the issue by removing one by one the component on motherboard to determine which one failed. If identified any of the component failed, replace the component. If none of the component failed, replace the motherboard.
S10	MEM	3 blinks > short pause > 7 blinks > long pause > repeats	Possible memory failure	Memory subsystem configuration activity is in progress. Memory modules have been detected but appear to be incompatible or in an invalid configuration. If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed. If identified the memory failed, replace the memory.

Table 25. Diagnostic power LED codes (continued)

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
				If else, replace the motherboard.

WARNING: The power LED only serve as an indicator of the progress through the POST process. These LEDs do not indicate the problem that caused the POST routine to stop

Power LED issue

Power LED is not flashing amber on ChengMing 3977 and Optiplex D8 and OptiPlex D8 AIO platforms.

ChengMing 3977 and OptiPlex D8 and D8 AIO platforms without processor installed or when processor power cable is not connected; it may not have the power LED flashing amber as the diagnostic indicator. The BIOS behavior specification defines that:

1. If no processor is installed in the system, the power LED should flash amber in pattern of 2-3
2. If no processor cable is connected in the system, the power LED should flash amber in pattern of 2-2

Do not replace any hardware, it works as per the design. With the Boot guard (BtG) feature of Intel ME11.6, when processor power or processor is missing, then the system will shut down.

Affected Platforms:

- ChengMing 3977
- OptiPlex 3050/5050/7050
- OptiPlex 3050 AIO/5250 AIO/7450 AIO

Diagnostic error messages

Table 26. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the **Pointing Device** option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. **Contact Dell**
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.
DATA ERROR	The hard drive cannot read the data.
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in **Dell Diagnostics**.
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the

Table 26. Diagnostic error messages (continued)

Error messages	Description
	computer. Restart the computer. If the error appears again, **Contact Dell**
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > | -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, `Printer out of paper. Take the appropriate action.`
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.
INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM	The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.
KEYBOARD CLOCK LINE FAILURE	For external keyboards, check the cable connection. Run the **Keyboard Controller** test in **Dell Diagnostics**.
KEYBOARD CONTROLLER FAILURE	For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the **Keyboard Controller** test in **Dell Diagnostics**.
KEYBOARD DATA LINE FAILURE	For external keyboards, check the cable connection. Run the **Keyboard Controller** test in **Dell Diagnostics**.
KEYBOARD STUCK KEY FAILURE	For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the

Table 26. Diagnostic error messages (continued)

Error messages	Description
	keyboard or keys during the boot routine. Run the **Stuck Key** test in **Dell Diagnostics**.
LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT	Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.
MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ALLOCATION ERROR	The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.
MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT DEVICE AVAILABLE	The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.
NO BOOT SECTOR ON HARD DRIVE	The operating system may be corrupted, **Contact Dell**.
NO TIMER TICK INTERRUPT	A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**.
NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN	You have too many programs open. Close all windows and open the program that you want to use.
OPERATING SYSTEM NOT FOUND	Reinstall the operating system. If the problem persists, **Contact Dell**.
OPTIONAL ROM BAD CHECKSUM	The optional ROM has failed. **Contact Dell**.
SECTOR NOT FOUND	The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See **Windows Help and Support** for instructions (click **Start** > **Help and Support**). If a large number of sectors are defective, back up the data (if possible), and then format the hard drive.
SEEK ERROR	The operating system cannot find a specific track on the hard drive.
SHUTDOWN FAILURE	A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**. If the message reappears, **Contact Dell**.
TIME-OF-DAY CLOCK LOST POWER	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, **Contact Dell**.
TIME-OF-DAY CLOCK STOPPED	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an electrical outlet to charge the battery. If the problem persists, **Contact Dell**.

Table 26. Diagnostic error messages (continued)

Error messages	Description
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	The time or date stored in the system setup program does not match the system clock. Correct the settings for the **Date and Time** options.
TIMER CHIP COUNTER 2 FAILED	A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**.
UNEXPECTED INTERRUPT IN PROTECTED MODE	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the **System Memory** tests and the **Keyboard Controller** test in **Dell Diagnostics** or **Contact Dell**.
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	Insert a disk into the drive and try again.

Verifying system memory

Windows 10

1. Clickthe **Windows** button and select **All Settings** > **System** .
2. Under **System**, click **About**.

Verifying system memory in setup

1. Turn on or restart your computer.
2. After the Dell logo is displayed, tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
3. On the left pane, select **Settings** > **General** > **System Information**, the memory information is displayed on the right pane.

Testing memory using ePSA

1. Turn on or restart your computer.
2. After the Dell logo is displayed:
   a. Press F12.
   b. Select ePSA diagnostics

   The PreBoot System Assessment (ePSA) starts on your computer.

   NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Turn off the computer and try again.

System error messages

Table 27. System error messages

System message	Description
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The computer failed to complete the boot routine three consecutive times for the same error.
CMOS checksum error	RTC is reset, **BIOS Setup** default has been loaded.

Table 27. System error messages (continued)

System message	Description
CPU fan failure	CPU fan has failed.
System fan failure	System fan has failed.
Hard-disk drive failure	Possible hard disk drive failure during POST.
Keyboard failure	Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.
No boot device available	No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists. • If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device. • Enter system setup and ensure that the boot sequence information is correct.
No timer tick interrupt	A chip on the system board might be malfunctioning or motherboard failure.
NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem	S.M.A.R.T error, possible hard disk drive failure.

Real-Time Clock (RTC Reset)

The Real Time Clock (RTC) reset function allows you or the service technician to recover Dell systems from No POST/No Power/No Boot situations. The legacy jumper enabled RTC reset has been retired on these models.

Start the RTC reset with the system powered off and connected to AC power. Press and hold the power button for 20 seconds. The system RTC Reset occurs after you release the power button.

Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell proposes multiple options for recovering Windows operating system on your Dell PC. For more information. see Dell Windows Backup Media and Recovery Options.

Wi-Fi power cycle

If your computer is unable to access the Internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

8

Technical specifications

Topics:

Processor specifications

OptiPlex 7050 systems are shipped with Intel 6th generation and 7th generation core processor technology.

NOTE: The clock speed and performance varies depending on the workload and other variables. Total cache up to 8 MB cache depending on processor type.

Feature	Specification
Processor type	• Intel Core i3-6100 (DC/3MB/4T/3.7GHz/65W) • Intel Core i5-6400 (QC/ 6MB/4T/2.7GHz/65W) • Intel Core i5-6500 (QC/6MB/4T/3.2GHz/65W) • Intel Core i5-6600 (QC/6MB/4T/3.3GHz/65W) • Intel Core i7-6700 (QC/8MB/8T/3.4GHz/65W) • Intel Core i3-7100 (DC/3MB/4T/3.9GHz/65W) • Intel Core i3-7300 (DC/4MB/4T/4.0GHz/51W) • Intel Core i5-7400 (QC/6MB/4T/3.0GHz/ 65W) • Intel Core i5-7500 (QC/6MB/4T/3.4GHz/65W) • Intel Core i5-7600 (QC/6MB/4T/3.5GHz/65W) • Intel Core i7-7700 (QC/8MB/8T/3.6GHz/65W)
Total cache	Up to 8 MB cache depending on processor type

Memory specifications

Feature	Specification
Type	2400 MHz **NOTE:** For 6th Generation processors, memory of 2400 MHz operates at 2133 MHz.
Connectors	Four DDR4 UDIMM slots
Memory capacity per slot	4 GB, 8 GB, and 16 GB

Feature	Specification
Minimum Memory	4 GB
Maximum Memory	64 GB

Video specifications

Feature	Specification
Video Controller - Integrated	For Intel 7th generation processors: ● Intel HD 630 Graphics [with 7th Generation Core i3/i5/i7 CPU-GPU combo] For Intel 6th generation processors: ● Intel HD 530 Graphics [with 6th Generation Core i3/i5/i7 CPU-GPU combo]
Video Controller - Discrete	● 1 GB AMD Radeon R5 430 (optional) ● 2 GB AMD Radeon R5 430 (optional) ● 4 GB AMD Radeon R7 450 (optional)
Video Memory	independent card offering

Audio specifications

Feature	Specification
Controller	Realtek ALC3234 High Definition Audio Codec (integrated, supports multiple streaming)
Internal speaker amplifier	Integrated

Communication specifications

Table 28. Communication specifications

Feature		Specification
Network adapter	Integrated	Intel® i219-V Gigabit1 Ethernet LAN 10/100/1000 (Remote Wake Up, PXE and support)
	Wireless (optional)	Intel® Dual-Band Wireless-AC 8265 Wi-Fi + BT 4.2 Wireless Card (2x2), MU-MIMO (optional)

Storage specifications

Feature	Specification
Hard drive	one 3.5-inch hard drive or two 2.5-inch drive
Solid State Drive	One 2.5-inch and/or one m.2 PCIe SSD
Optical drive	one slim drive
RAID	The system does not support RAID 0 or RAID 1 capability.

Ports and connectors specifications

Table 29. Ports and connectors

Feature		Specification
Front I/O ports	Universal audio jack	One
	USB 3.1 Gen 1	Four
	USB 2.0	Two
Rear I/O ports	USB 3.1 Gen 1	Two
	USB 2.0	Two
	Serial	One
	Line out	One
	HDMI Port	One
	DisplayPort	Two
	Network port RJ-45	One
	Power connector port	One
	PS/2	Two

Power supply specifications

Feature	Specification
Type	180 W
Frequency	47 Hz - 63 Hz
Voltage	90 VAC - 264 VAC
Input current	3 A / 1.5 A
Coin cell battery	3 V CR2032 lithium coin cell

Physical dimension specifications

Feature	Specification
Height	290.06 mm (11.42 inches)
Width	92.71 mm (3.65 inches)
Depth	292.10 mm (11.50 inches)
Weight	5.14 kg (11.42 lb)

Controls and lights specifications

Feature	Specification
Power button light	White light — Solid white light indicates power-on state; blinking white light indicates sleep state of the computer.
Hard Drive activity light	White light — Blinking white light indicates that the computer is reading data from or writing data to the hard drive.

Feature	Specification
Back panel:	
Link integrity light on integrated network adapter :	Green — a good 10 Mbps or 100 Mbps connection exists between the network and the computer. Orange — a good 1000 Mbps connection exists between the network and the computer. Off (no light) — the computer is not detecting a physical connection to the network.
Network activity light on integrated network adapter	Yellow light — A blinking yellow light indicates that network activity is present.
Power supply diagnostic light	Green light — The power supply is turned on and is functional. The power cable must be connected to the power connector (at the back of the computer) and the electrical outlet.

Environmental specifications

Airborne contaminant level: ISA-71 G1**: <300 A/month copper coupon corrosion AND <200 A/month of silver coupon corrosion

Description	Operating	Storage
Temperature range	10°C to 35°C (50°F to 95°F)	-40°C to 65°C (-40°F to 149°F)
Relative humidity (maximum)	20% to 80% (non-condensing)	5% to 95% (non-condensing)
Vibration (maximum) *	0.26 GRMS	1.37 GRMS
Shock (maximum)	40 G†	105 G‡
Altitude range	-15.20 m to 3048 m (-50 ft to 10,000 ft)	–15.20 m to 10,668 m (–50 ft to 35,000 ft)

* Measured using a random vibration spectrum that simulates user environment.

† Measured using a 2 ms half-sine pulse when the hard drive is in use.

‡ Measured using a 2 ms half-sine pulse when the hard-drive head is in parked position.

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Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 30. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows www.dell.com/support/linux
Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.	www.dell.com/support
Dell knowledge base articles for a variety of computer concerns.	1. Go to https://www.dell.com/support/home/?app=knowledgebase. 2. Type the subject or keyword in the **Search** box. 3. Click **Search** to retrieve the related articles.
Learn and know the following information about your product: • Product specifications • Operating system • Setting up and using your product • Data backup • Troubleshooting and diagnostics • Factory and system restore • BIOS information	See *Me and My Dell* at www.dell.com/support/manuals. To locate the *Me and My Dell* relevant to your product, identify your product through one of the following: • Select **Detect Product**. • Locate your product through the drop-down menu under **View Products**. • Enter the **Service Tag number** or **Product ID** in the search bar.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

NOTE: Availability varies by country and product, and some services may not be available in your country.

NOTE: If you do not have an active internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.